LAND USE TRENDS IN OTTAWA - CARLETON 1981 - 1986

THE REGIONAL MUNICIPALITY OF OTTAWA-CARLETON
PLANNING DEPARTMENT
POLICY AND PROGRAM DIVISION

OCTOBER, 1988

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INTRODUCTION

Guiding the use of land is fundamental to maintaining the quality of life in Ottawa-Carleton. The Regional Official Plan contains policies for land use and the physical development of Ottawa- Carleton intended to achieve goals in social, economic and environmental matters. Monitoring land use change provides a basis for evaluating the effectiveness of Official Plan policies and keeping them up to date.

This report analyzes trends in the use and consumption of urban land in Ottawa-Carleton. It is based on the Region's 1985 Land Use Survey, updated to reflect the land use situation at the time of the 1986 Census. Additional analysis is being presented to incorporate data now available from the Region's 1986 Employment Survey and the 1986 Census.

Coverage and Methodology

Land use surveys have been undertaken by the Planning Department on a regular basis since 1970. Land categorized as inside the greenbelt includes all urban land inside the outer limits of the greenbelt. Urban land outside the greenbelt comprises the three urban centres (Orleans, Barrhaven and the urban area of Kanata).

Details of the Land Use Survey methodology are contained in Appendix A of this report.

Most land use statistics in this document are reported in "gross" hectares - i.e. including roads. Where roads are excluded, figures are shown as "net".

Further explanation is provided in Appendix B.

Organization of the Report

The report is comprised of three principal sections. Part 1 highlights some of the significant trends in urban land use in Ottawa-Carleton. Part 2 discusses in more detail changes in the Region's land use up to 1986. Part 3 of the report examines land use density and land consumption rates in relation to growth in jobs, households and population, and discusses possible future trends.

Although the body of this report deals exclusively with urban land use, Appendix C contains 1985 land use maps for the Region's 29 villages including a brief summary of rural land use change between 1981 and 1985.

1.0 HIGHLIGHTS

1. **Average urban density in Ottawa-Carleton declined slightly in the 1981-86 period, due to decreasing densities of residential and industrial land and an increased amount of open space. The popularity of single detached housing and current trends in industrial development suggest that density will continue to decrease over the next 5 to 10 years.**
2. **Measured against growth in households, land consumption has increased significantly since 1981. This is due to a slowdown in the rate of decline in average household size combined with lower housing densities. In future, with only slight decreases in household size expected and continued emphasis on single detached housing, per household land consumption will likely increase further.**
3. **Fifty-five (55%) of all urban land consumed between 1981 and 1986 was in the urban centres (Orleans, Kanata and Barrhaven), the first period in which consumption outside the greenbelt exceeded that inside the greenbelt. As vacant residential land becomes depleted within the greenbelt, the emphasis on development outside the greenbelt will increase.**
4. **Declining residential densities may make some goals of the new Regional Official Plan more difficult to achieve (eg. transit usage); however, suburbanization of employment land could be supportive of Official Plan goals if development is directed to employment nodes which can be well served by transit and road systems.**

2.0 URBAN LAND: CURRENT USE AND PAST TRENDS

2.1 Rate of Urbanization in Ottawa-Carleton

Between 1961 and 1986, the gross amount of urbanized land in Ottawa-Carleton doubled in size to almost 19,500 hectares. During the same period, urban population increased by only 70 percent.

The expansion of urban development in Ottawa-Carleton between 1961 and 1986 is depicted in general form in Figure 1. The major features of change visible during the last 25 years are the filling in of much of the available vacant land inside the greenbelt and the growth of the urban centres - Kanata, Orleans and Barrhaven - outside the greenbelt.

Despite the large increase in urban land, in 1986 the vast majority (93%) of the Region's total land area remained in non-urban, primarily rural, use (Figure 2).

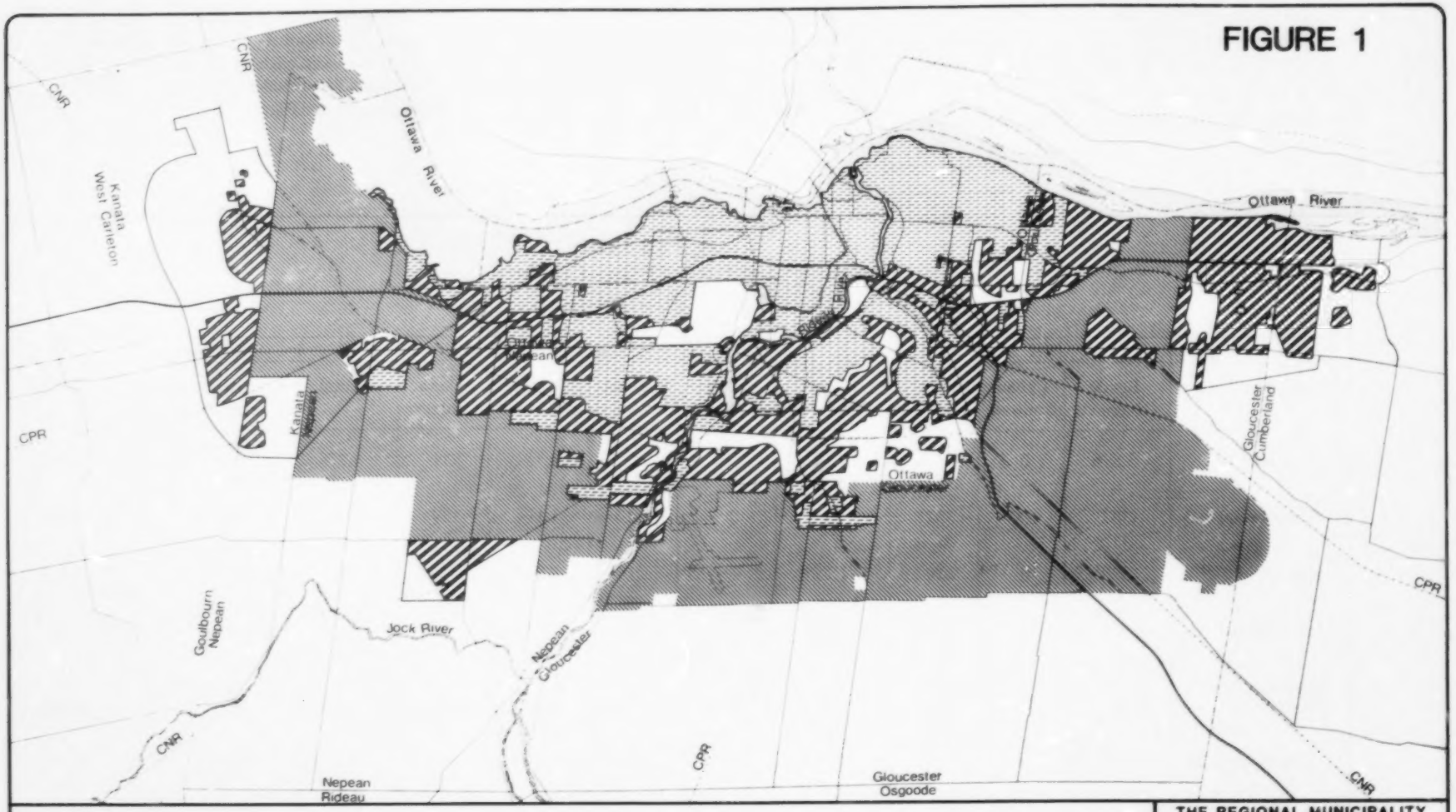
Figure 2

DISTRIBUTION OF URBANIZED AND NON-URBANIZED LAND IN RMOC, 1961-86 (gross hectares)

	1961		1971		1981		1986	
	ha	%	ha	%	ha	%	ha	%
Urbanized Land [1]	9,753	3.5	13,400	4.8	17,288	6.3	19,429	7.0
Non-urbanized	266,941	96.5	263,294	95.2	259,406	93.8	257,265	93.0
Total	276,694	100	276,694	100	276,694	100	276,694	100

[1] Urbanized land includes all urban land except vacant. Figures are gross hectares - i.e. including roads and bodies of water.

FIGURE 1



URBAN GROWTH
(1961 - 1986)

EXTENT OF URBAN AREA - 1961

EXTENT OF URBAN AREA - 1986

GREENBELT

THE REGIONAL MUNICIPALITY OF OTTAWA-CARLETON

Planning Urbanisme

MUNICIPALITÉ RÉGIONALE D'OTTAWA-CARLETON

2.5 0 2.5km.

2.2 Trends in Urban Land Use

Change in the principal urban land uses from 1961 to 1986 is summarized in Figure 3 for areas inside the greenbelt, the urban centres, and the total urban area.

Of the total 2,140 gross hectares of land consumed in the 1981-86 period, more than half (55%) were developed in the urban centres of Orleans, Kanata and Barrhaven. This is the first study period in which land consumption in the urban centres exceeded consumption inside the greenbelt, but it represents a continuation of earlier trends.

(In this report, urban land includes all areas designated "Principal Urban Area" on Schedule A of the existing (1974) Regional Official Plan as shown on the office consolidation dated 6 April 1987. Land in the urban centres includes only Stage 1 lands in Kanata, Orleans and Barrhaven.)

Figure 3
Urban Land Use in Ottawa-Carleton
1961, 1971, 1981, 1986 (net hectares)

	1961			1971			1981			1986		
Land Use Type	**Inside Greenbelt**	**Urban Centres**	**Total**	**Inside Greenbelt**	**Urban Centres**	**Total**	**Inside Greenbelt**	**Urban Centres**	**Total**	**Inside Greenbelt**	**Urban Centres**	**Total**
Residential	3,876	0	3,876	5,466	386	5,852	6,332	944	7,276	6,786	1,483	8,269
Commercial	387	0	387	613	0	613	1,114	129	1,243	1,180	150	1,330
Industrial	820	0	820	1,157	7	1,164	1,233	81	1,314	1,402	117	1,519
Institutional	507	0	507	683	26	709	1,272	100	1,372	1,324	134	1,459
Recreation/ Open Space	2,387	0	2,387	2,684	55	2,739	2,925	288	3,213	3,012	650	3,662
Subtotal (net ha)	7,977	0	7,977	10,603	474	11,077	12,876	1,542	14,419	13,704	2,534	16,238
Vacant	9,278	6,510	15,788	6,188	5,953	12,141	3,452	4,801	8,253	2,478	3,634	6,112
Roads and water	1,581	195	1,776	2,045	278	2,323	2,508	362	2,870	2,654	537	3,191
Total (gross ha)	18,836	6,705	25,541	18,836	6,705	25,541	18,836	6,705	25,541	18,836	6,705	25,541

Despite signs of increased infilling and redevelopment activity inside the greenbelt during the mid-1980s[1], recent land consumption patterns represent an acceleration in the shift toward the new urban centres (Figure 4 refers).

The shift of growth to the outer urban areas is depicted in Figure 5. Average annual land consumption has been steadily declining within the greenbelt, but has doubled in each successive time period in the lower density urban centres. Coincidentally, the average annual consumption of urban land in Ottawa-Carleton has also been increasing - from 365 gross hectares per year during 1961-71, to 389 hectares a year between 1971 and 1981, and 428 hectares a year during 1981-86.

At the consumption rate of 1981-86, the 6,112 gross hectares of vacant land existing in 1986 could yield 14.3 years of urban land supply[2]. However, as depicted in Figure 6, the Region's supply of vacant urban land is not evenly distributed among major land uses or between areas inside and outside the greenbelt.

Vacant land inside the greenbelt accounted for about 40% of total vacant land supply in 1986, but developable vacant land is reduced by requirements for future transportation corridors (eg. Hunt Club Road extensions, Inner Provincial Highway bypass, Queensway/Hwy 416 interchange, Nicholas/Industrial Connection, etc.).

Of developable vacant land inside the greenbelt, there was about twice as much land designated for industrial use as for residential development in 1986. Residential land within the greenbelt accounted for only 21% of the Region's total supply in 1986, while industrial land represented 53% of the total inventory. Between 1981 and 1986, consumption of residential land inside the greenbelt actually exceeded the supply remaining in 1986 (although in practical terms, areas inside the greenbelt will not be depleted of housing land for some years due to rezonings and release of federal land holdings for housing development).

Figure 4
Average Annual Urban Land Consumption: Inside Greenbelt, Urban Centres and Total, 1961-86

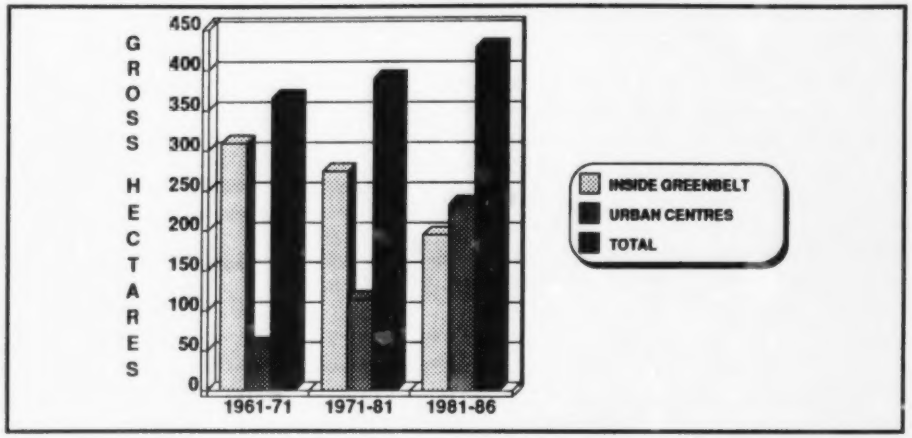
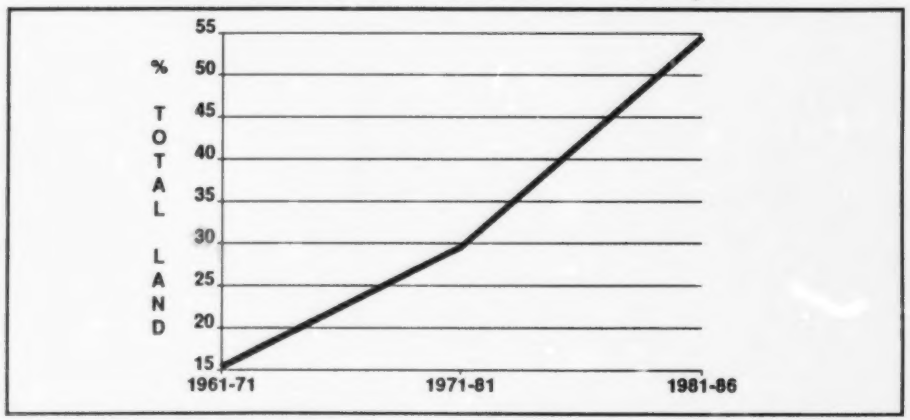


Figure 5
Urban Centres Share of Total Land Consumption



In the urban centres, the proportion of vacant residential to industrial land was reversed, with about twice as much residential land available.

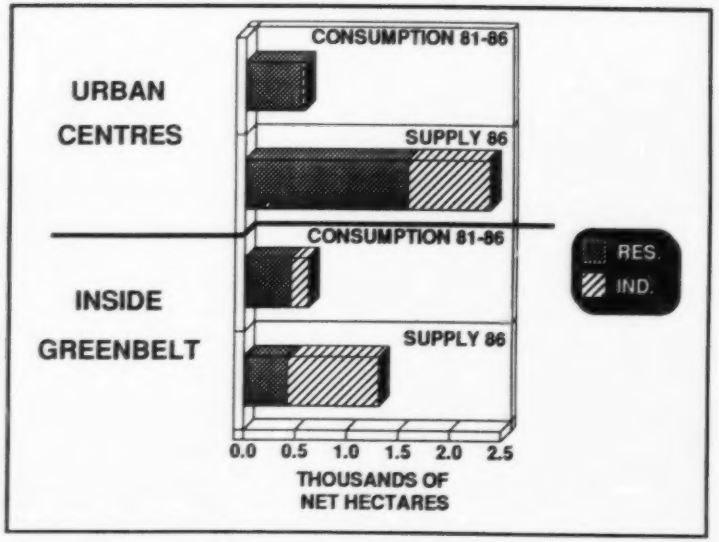
[1] See Vacant Urban Residential Land Survey, 1987 Update, RMOC Planning Department, May 1988, p.5

[2] The 6,112 ha of vacant land represents Stage 1 lands only in the old Official Plan. The new Plan adopted in 1988 significantly increases the amount of urban land.

However, while residential land consumption in the urban centres was only slightly higher than inside the greenbelt during 1981-86, almost five times as much industrial land was consumed inside the greenbelt (169 net hectares versus 35).

As vacant land becomes depleted inside the greenbelt, the urban centres will account for ever larger shares of future land consumption. If the current relatively low development densities persist in the urban centres, further increases in total land consumption could result, thereby reducing the number of years supply available from existing reserves of vacant land.

Figure 6
Consumption versus Supply of Residential and Industrial Land[1], 1981-86



[1]**Figure 6 Note:** Vacant residential land is an average of 1985 and 1986 (year-end) Updates, Vacant Urban Residential Land Survey, RMOC Planning Dept.; vacant industrial supply is taken from Vacant Industrial Land Inventory 1986, RMOC Planning Dept.

Changes by Land Use Type

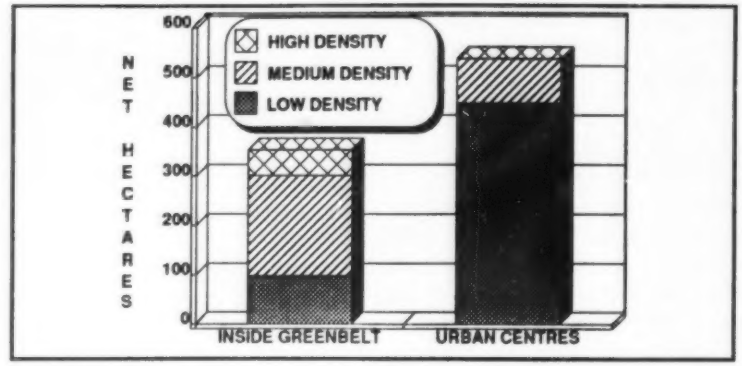
Residential
In terms of net hectares, land uses other than roads consumed 1,820 hectares during the 1981-86 period. Over half (55%) of this amount was consumed for residential use (Figure 7 refers).

Figure 7
Land Consumption by Use (net hectares), 1981-86

Land Use Type	Inside Greenbelt	Urban Centres	Total Urban	% of Total
Residential	454	539	993	55%
Commercial	66	21	88	5%
Industrial	169	35	205	11%
Institutional	52	34	86	5%
Recreation/ Open Space	87	362	449	25%
Total Developed	828	992	1,820	100%

If residential development is further broken down into low, medium and high density categories, interesting patterns emerge. Low density residential development in the urban centres outside the greenbelt was the single largest component of land use change, accounting for 25% of total urban land consumption in Ottawa-Carleton (Figure 8). Inside the greenbelt, residential land use displayed much higher proportions of medium and high-density development.

Figure 8
Residential Land Consumption by Density Type, 1981-86 net hectares



Open Space

Recreation and open space land constituted the second largest category of change (Figure 7), increasing by 449 hectares. Over 80% of the increase occurred in the urban centres due primarily to the addition of the waterfront lands and ravines in Orleans. In the previous 1981 survey these lands had been classed as vacant since they were not developed or available for public use.

Industrial and Commercial

Industrial land use increased some 205 hectares of which 83% were located inside the greenbelt. Similarly, 76% of the 88 hectare increase in commercial land (retail and office uses) occurred within the greenbelt. (It should be noted that part of the increase in industrial land is due to the reclassification of some commercial land from the 1981 survey).

A large part of the growth in commercial and industrial land use took place in suburban locations within the greenbelt, related to new shopping centres (eg. Pinecrest and Heron Gate), suburban office development (eg. Carling Executive Park), and construction of new office and industrial buildings in the business parks of Ottawa and Nepean. Only 8% of commercial land use growth occurred in the central area.

Institutional

Growth in institutional uses displayed a somewhat different pattern. Of the 86 hectare increase, a relatively larger share (40%) was located in the urban centres outside the greenbelt. This was due primarily to the addition of new elementary schools to accommodate the rapid increase in families with young children. The urban centres accounted for 75% of the increase in school land, but only one quarter of the growth in other institutional uses (eg. cultural facilities, churches, and hospitals).

Trends in Land Use Change

In proportional terms (Figure 9), the overall 1986 land use pattern shows a number of changes from previous years. Residential uses have increased their share, following a decrease during the 1970s. This is attributed to the maturing of the baby boom from young apartment-dwelling households in the 1970s to increased affluence and child-rearing in the homeownership market of the 1980s. Between 1981 and 1986, single detached housing accounted for 47% of housing starts, compared to only 18% during the 1971-81 period. Recreation and open space land also increased slightly in proportion between 1981 and

Figure 9
Land Use Type as a Percentage of Net Urbanized Land

Land Use Type	1961	1971	1981	1986
Residential	48.6	52.8	50.5	50.9
Commercial	4.8	5.5	8.6	8.2
Industrial	10.3	10.5	9.1	9.4
Institutional	6.4	6.4	9.5	9.0
Recreation/Open Space	29.9	24.7	22.3	22.6
Total	100%	100%	100%	100%

1986, after declining steadily since the 1960s. The recent increase is attributable to the aforementioned addition of open space and ravine land in Orleans. The proportion of open space land may rise slightly in the medium term with the development of the Marchwood-Lakeside area of Kanata, and in the longer term with the addition of open space land along the Jock and Rideau Rivers in the South Urban Centre.

The industrial land share also increased, related to the growth of lower density business parks. The recent rapid development of business parks (eg. Rideau Heights, Ottawa Business Park) suggests that this trend will continue at least in the short term. This pattern may eventually slow, however, as uses intensify through building expansion.

After considerable growth during the 1971-81 period, commercial and institutional uses both declined in their share of land use during the 1980s. This is attributed to building expansions and infilling on land initially established for major facilities during the 1970s (eg. the Children's Hospital and Ottawa General).

3.0 LAND USE DENSITY AND CONSUMPTION TRENDS

Historically, overall population density in Ottawa-Carleton has been declining, while household density (i.e. housing units per gross hectare) has increased. Between 1981 and 1986, however, population density declined only slightly, and household density remained unchanged (Figure 10 refers). Reasons for this change are discussed in detail in the following sections.

3.1 Trends in Residential Land Use Density

3.1.1 Population Density

Population density (the number of persons per hectare of residential land) continued to decline between 1981 and 1986, but the overall rate of decline is flattening out following the steep drop of the 1970s. The gap in densities between the urban centres and areas inside the greenbelt is narrowing as the outer urban areas continue to increase in density while inner areas decrease (Figure 11).

Several factors contribute to this pattern. Inside the greenbelt, established residential uses constitute the bulk of housing land. This mass of existing housing creates an increasing inertia to change in each succeeding time period. As a result, changes in residential land use have only a marginal effect on average population density. Most of the decline experienced is actually due to decreases in average household size. Hence the decline reflects primarily social, not physical, change inside the greenbelt.

Figure 10
Gross Urban Densities, 1961-86
(per gross hectare of urbanized land)

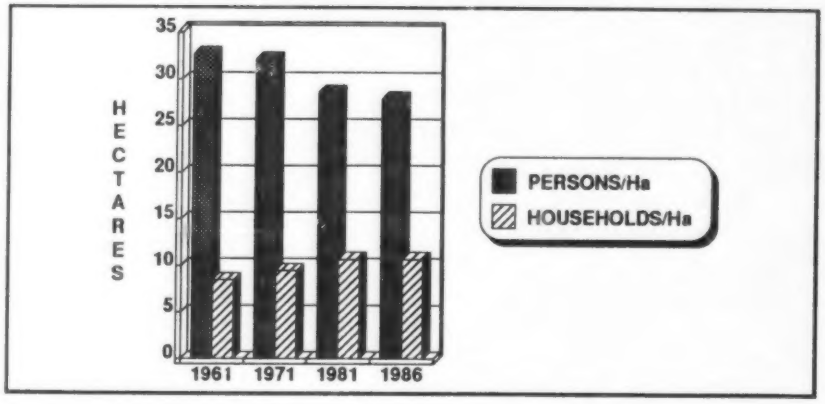
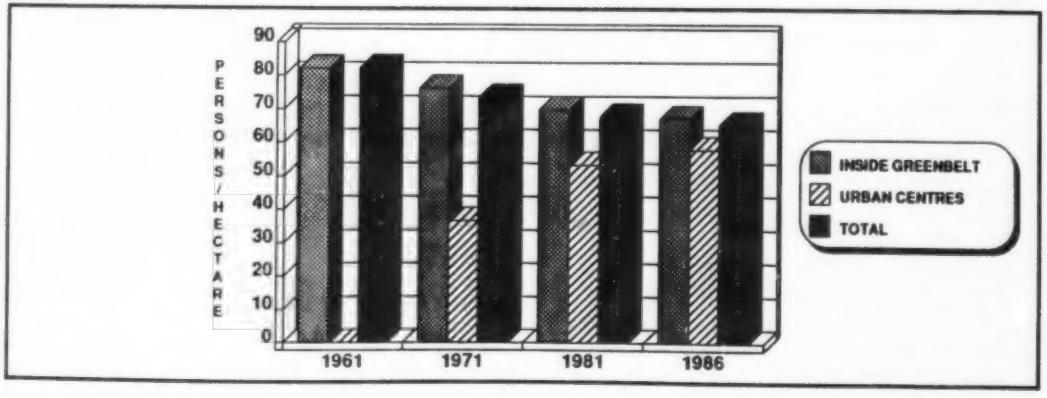


Figure 11
Urban Population Densities
(persons/net hectare of residential land)



Outside the greenbelt, the inertial effect of a large block of existing development has been experienced only recently. As shown in Figure 12, development prior to 1971 occurred at very low densities. Additions to residential land after 1971 represented large proportional increases to the urban centres and involved considerably higher densities. Between 1971 and 1981, average densities in the new urban centres quickly increased, as new development at almost twice the existing density increased residential land area by 250%. Between 1981 and 1986, new development continued at similar densities to those of 1971-81, but urbanized land increased by only about 60%. Hence, as inertia grew, average density increased at a lesser rate (Figure 11).

As the Kanata and Orleans urban centres mature in the future, two key factors will exert themselves:

- increases in residential land will tend to represent increasingly smaller shares of established urban uses.
- average household size will decline as households mature and diversify in type, particularly after 1991.

It is therefore probable that while population density in the urban centres will increase somewhat by 1991, later periods will see a decline. Although the decrease may be tempered by construction of higher density apartments adjacent to the town centres, a trend to smaller households would be consistent with the evolution of other suburban areas of the Region.

Inside the greenbelt, the rate of decrease is easing, indicating only slight declines in the future.

These effects overall point to a stabilization of urban population density by 1991, followed by slight declines.

3.1.2 Household Density

Average household densities (occupied dwelling units per net residential hectare) decreased moderately in 1986, the first period in which density has not risen (Figure 12).

This occurred despite increases in density both inside the greenbelt and in the urban centres. This apparent contradiction is explained by the urban centres' large share (47%) of total housing units built in urban Ottawa-Carleton between 1981 and 1986, combined with their lower than average housing density. Even though housing densities continued to increase in the urban centres, the high volumes of lower density housing built since 1981 added enough units in the outer areas to pull down the overall average.

Figure 12
Urban Household Densities
(occupied dwelling units/net ha of residential land)

Year	Inside Greenbelt	Urban Centres	Total Urban
1961	21.4	—	21.4
1971	22.6	9.4	21.7
1981	26.8	15.3	25.3
1986	26.9	17.2	25.1

In future, several changes could be expected in net household density:

- a slowing in the rate of increase in residential density in the urban centres in the medium term (5 to 10 years), based on assumed high proportions of single detached house construction. In the longer term, moderate density increases are possible depending on the number of apartments constructed to house the then aging population of these areas.
- slight increases in density within the greenbelt, due to redevelopment and intensification activity.
- overall urban density will decline as the lower density urban centres outside the greenbelt continue to increase their share of new housing development in Ottawa-Carleton.

3.2 Trends in Non-Residential Land Use Density

As discussed in the preceding section, household density measures (rather than population) provide a clearer indication of trends, as the influence of changing household size is removed.

Non-residential land use density therefore refers to the relationship between number of households and the area of non-residential land uses (commercial, industrial, institutional and open space). For example, increasing density in commercial land implies that more households are using each hectare of commercial land (either retail or offices). This would suggest some combination of factors such as higher intensity land development, more retail sales per square metre, or reduced space per office employee. This would point in future to correspondingly lower amounts of non-residential land consumed for each new household, if the trend continues.

Historically, the density of specific non-residential land uses, particularly commercial and institutional, has been more volatile than residential density. This is due to the relatively indirect relationship between growth in non-residential land use and change in

population or households. While residential land is added incrementally to accommodate household growth through the construction of new houses and apartments, facilities such as regional shopping centres, hospitals and major office complexes tend to be built at irregular intervals, dependent on the prevailing economic climate and other factors not directly linked to household growth. In addition, many larger non-residential land users (eg. Carleton University) possess sufficient land for future expansion without acquiring new land. Due to these factors, changes in non-residential land use are often out of step with demographic change.

Between 1981 and 1986, overall non-residential density continued to increase, but at a declining rate approaching no change (Figure 13). However, commercial and institutional densities, which had declined so markedly during the 1971-81 period, increased slightly. This could be due to a combination of redevelopment of land to more intensive uses (eg. Rideau Centre, Westin Hotel, Metropolitan Life), building expansions (eg. St. Laurent Shopping Centre), and more intensive use of existing floor space.

Industrial densities declined slightly, related to increased development in low density business parks. Recreation/open space density also decreased, indicating a greater availability of urban open space per household (primarily due to open space additions in Orleans).

By comparison, changes in non-residential density measured against population are more volatile (Figure 14) and average density appears to be declining, due to the effect of decreasing household size.

In future, the following changes in non-residential density in terms of households may occur:

- the rise in commercial densities will be stabilized by an increase in suburban retail and office development (at lower than average density).
- industrial densities will continue to decline at least into the 1990s due to the spread of low density business parks.

Figure 13
Non-Residential Land Use Density: Households
(households per net hectare)

	1961	1971	1981	1986
Commercial	214.3	207.1	148.3	156.3
Industrial	101.1	109.1	140.3	136.8
Institutional	163.6	179.0	134.4	142.5
Recreation/Open Space	34.7	46.3	57.4	56.8
Total Non-Res. Density[1]	20.2	24.3	25.8	26.1

[1]excludes roads, water and vacant land

- institutional densities may increase slightly given limited capital funds for construction of new schools and hospitals.
- recreation/open space density may not change.
- overall non-residential density does not appear likely to change significantly.

3.3 Rates of Urban Land Consumption

Average annual land consumption has increased steadily since 1961, and at a slightly increasing rate of growth (Figure 15). Annual land consumption in the 1970s was 8% higher than the 1960s; consumption between 1981 and 1986 was 9% higher than 1971-81.

Figure 14
Non-Residential Land Use Density: Population
(persons per net hectare)

	1961	1971	1981	1986
Commercial	824	680	397	407
Industrial	389	360	376	357
Institutional	628	610	360	372
Recreation/Open Space	133	155	154	148
Total Non-Res. Density[1]	78	83	69	68

[1]excludes roads, water and vacant land

Recent land consumption relative to population growth has decreased significantly from the rate set during 1971-81. Between 1981 and 1986, total land consumption was 45 gross hectares for every 1,000 persons of population growth. This was 30% lower than the 62 gross hectare per 1,000 rate of the 1971-81 period.

The high rate of the 1970s was largely due to major additions of commercial and institutional land, to some extent a catching-up in shopping centres, schools and hospitals not built in the 1960s when only 33 ha per 1,000 population were consumed (Figure 16 refers). The lower consumption rate since 1981 is mainly attributable to a drop in non-residential land absorption; consumption of residential land declined only slightly when measured against population growth (Figure 16).

However, when measured against growth in households, land consumption rates (shown in Figure 17) have increased significantly since the 1970s. This was due to a combination of lower densities in new housing and a slowing in the rate of decline in average household size. During the 1970s, housing densities were inflated by an increase in apartment construction, but overall population density declined due to a large decrease in average household size. (In other words, there were more dwelling units per hectare, but fewer people on average living in each dwelling.) During the 1981-86 period, housing density declined as the baby boom moved into the homeownership market and apartment construction gave way to single detached units.

Figure 15
Average Annual Urban Land Consumption

Period	1961-71	1971-81	1981-86
Net hectares/year	310	334	364
Gross hectares/year	365	389	428

3.4 Employment Densities and Land Consumption

Between 1981 and 1986, Ottawa-Carleton experienced significant growth in employment. The number of jobs in the urban area increased by 45,825 (16.4%), compared to 18,125 (6.9%) between 1976 and 1981. The relationship between employment increases and land use change can be analyzed only for

Figure 16

Land Consumption Per Capita
(net hectares of land consumed per 1,000 population increase)

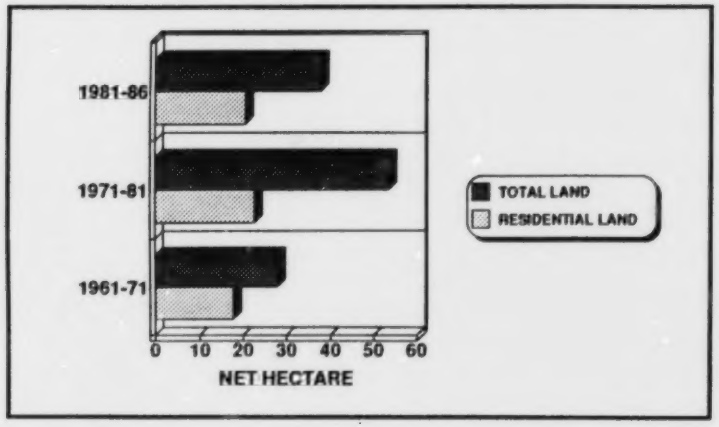
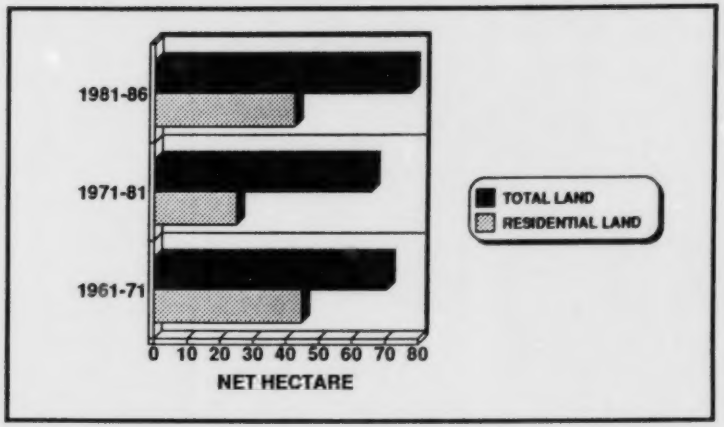


Figure 17

Land Consumption Per Household
(net hectares of land consumed per 1,000 household increase)



the 1981-86 period, as surveys of land use and employment were not undertaken concurrently prior to 1981.

Employment densities (the number of workers per hectare) have increased both within the greenbelt and in the urban centres (Figure 18). However, percentage increases were highest in the lowest density areas, the urban centres (up 12%), and lowest in the high density central area (up 2%). In other areas within the greenbelt, densities increased 7%. Although densities in the urban centres increased proportionately more than areas within the greenbelt, they remained only 51% and 53% respectively, of the 1981 and 1986 urban averages.

Figure 18
Employment Density
(employees/net hectare of Commercial, Industrial and Institutional[1] land)

Year	Central Area	Other Areas Inside Greenbelt	Urban Centres	Total Urban
1981	732.1	64.9	33.0	80.0
1986	744.0	69.7	37.0	84.1

[1]Institutional excludes cemeteries, churches, community centres, and day care centres.

In terms of consumption rate during 1981-86, significant differences also exist between the three areas. In the central area only 1.1 hectares of "employment" land (commercial, industrial, and institutional) were consumed for each 1,000 employment increase, compared to 8.2 hectares per 1,000 in other areas inside the greenbelt, and 19.4 hectares per 1,000 in the urban centres. As shown in Figure 19, the high consumption rate in the urban centres is primarily due to the situation in Kanata. Here, the large component of advanced technology industrial and office uses, in addition to consuming large quantities of land for landscaping, parking and future expansion, experienced major layoffs in the early 1980s, thus reducing employment density. In Orleans and Barrhaven, employment uses established to date are concentrated in retailing and schools, and hence not subject to the same factors.

Within the greenbelt, part of the employment increase was achieved with no increase in land area (e.g. offices built at St. Laurent and Pinecrest Shopping Centres).

CONCLUSION: IMPLICATIONS FOR THE OFFICIAL PLAN

The possible trend to lower densities indicated by changes between 1981 and 1986 will make the goals of the new Regional Official Plan more difficult to achieve if the decline continues in the long term.

Decreasing residential densities, for example, challenge the goal of providing high levels of transit service in new areas, requiring that increased attention be given in the layout of subdivisions to the opportunity for efficient transit routes.

Declining densities also mean that costly sewer and water systems will serve a lower number of households for a given expenditure.

Similar concerns exist regarding the suburbanization of employment land. However, if development is directed to employment nodes outside of the central area which can be well served by road and transit systems, changes in commercial, industrial and institutional land uses could support Official Plan goals.

Figure 19
Land Consumption Per Job, 1981-1986
(net hectares of land[1] consumed per 1,000 employment increase)

Kanata	Orleans	Barrhaven	Inside Greenbelt	Total Urban Area
36.1	13.4	9.4	7.1	8.1

[1]Commercial, Industrial and Institutional land, excluding cemeteries, churches, community centres and day care centres.

APPENDIX A

Survey Methodology

Regional planning staff undertake a Land Use Survey once every five years.

In the summer of 1985, using air photographs and field maps at the scale of 1:1,250 in the urban area, and field maps at a scale of 1:12,500 for the rural area, field checks were conducted to identify changes in land use from the 1980/81 Survey. The area of each parcel was calculated from the field maps using an electronic planimeter.

Information from the field maps was transferred to maps at 1:10,000 scale for the urban area, and 1:12,500 scale for the rural area. These maps were subsequently reduced to the scale of 1:25,000 for the urban area, and 1:100,000 for the rural area for publication. Copies of the 1985 land use maps are available from the Regional Planning Department for a nominal charge.

Data Used in this Report

For the urban area only, data from the 1985 Land Use Survey was updated to 1986 using field checks and air photos.

Figures for 1981 urban land use have been revised from those used in the report on 1981 land use (Land Use in Ottawa-Carleton, RMOC Planning Dept., Aug., 1982). Revisions are a result of quality control improvements made possible by transferring the data to a microcomputer spreadsheet.

The survey adopted the principal use approach in which a single land use category is assigned to the entire site. For example, a manufacturing complex is assigned to industrial even though in addition to the actual production process, the site may include administrative offices, parking and an on-site retail outlet. In the case of mixed-use buildings, the predominant land use category is assigned.

For the purpose of this report, vacant urban land is defined as all open land, excluding water, that is not maintained, landscaped or used for any purpose.

Other land use categories are:

- Residential - low (e.g. singles and semis), medium (plexes and rowhouse units), and high density (apartments)
- Commercial - shopping centres, other retail and services, and offices
- Industrial - manufacturing, warehousing, construction, multiple-use industrial, and transportation/communication/utility lands.
- Institutional - educational institutions, churches, community centres, day care, hospitals, nursing homes, museums, cemeteries and other institutions.
- Recreation/Open Space - active and passive recreational uses, maintained open spaces, and Experimental Farm.

APPENDIX B

An Explanation of Net versus Gross Land Area Calculation

Land use statistics can be reported on either a "net" or "gross" basis. Net excludes incidental uses (roads and bodies of water - Rideau River, Canal and Dow's Lake), while gross includes all uses (i.e. the primary use - for example "residential" - plus roads and water) associated with the type of land being reported. The purpose of this note is to explain the difference between net and gross as used in this report.

Specific land use categories (commercial, institutional, etc.) must generally be reported on a net basis, as it is difficult to split the area occupied by major roads among the multiple land uses which they serve.

On average, roads account for approximately 15% of total (gross) urban land area. In new residential subdivisions about 20% of gross land area is consumed by roads, while in commercial and industrial areas between 10% and 14% of each gross hectare may consist of roads. Most open space/recreational areas contain less than 5% roads.

The distinction between gross versus net land area is particularly important in any evaluation of the Region's supply of vacant urban land. A given amount of vacant land may yield varying quantities of net developable land depending on the area occupied by existing and required future roads, and the type and mix of land uses developed.

In general, the vacant land supply is measured in gross terms - i.e. including the area occupied by future roads - and hence must be reduced by up to 20% to yield a net land area equivalent.

APPENDIX C

1985 Rural and Village Land Use

Changes in rural land use between 1981 and 1985 are summarized in Figure C-1.

Agriculture/cleared land and woodland accounted for 94% of land use in the rural area in 1985. Of the remaining 6% of land, the residential category accounted for 4,950 hectares in 1985, an increase of 15.5% over 1981.

Industrial land was the next largest category, covering 3,241 hectares, an increase of 7.7%. Of this increase, 27% (63 ha) was devoted to transportation, communications and utilities.

The largest percentage increase was in extractive industries, which grew by 35.1%. Recreation uses increased by 19.4%.

The following land use maps for each village show the situation in 1985. Comparing the situation with 1981 by municipality, villages in Cumberland Township experienced the greatest growth in land use (169.5 hectares), followed by Goulbourn (89.4 hectares), Rideau (87.8 hectares), and Osgoode (81.3 hectares). The individual villages which saw the most expansion in land use terms were, in descending order, Cumberland, Stittsville, Manotick and Osgoode.

Ninety-one percent (91%) of all new development in villages between 1981 and 1985 was for residential use. The increase in residential land in the villages amounted to 63% of overall residential growth in the rural area. In all other types of land use, development outside of villages was greater than that which occurred in villages.

Figure C -1
Rural Land Use In Ottawa-Carleton
1981 and 1985 (gross hectares)

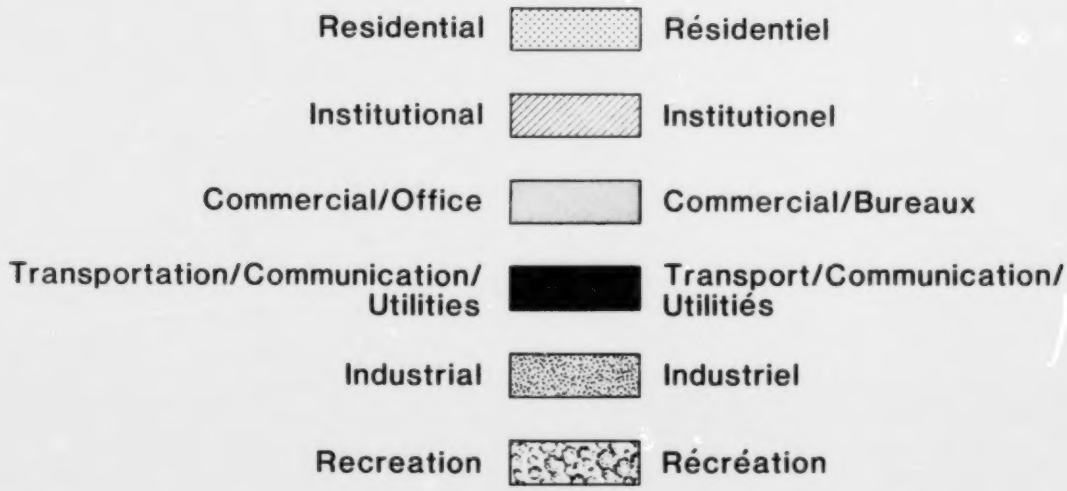
Land Use	1981	1985
Residential	4,282	4,946
Commercial	239	199
Industrial [2]	3,009	3,241
Institutional	1,962	2,039
Recreational	1,278	1,526
Agriculture/Cleared Land	160,739	150,246
Woodland	75,762	82,452
Extractive Industry	1,543	2,084
Marsh[3]	—	4,212
Total[1]	248,814	250,945

[1] Difference due to planimeter error.

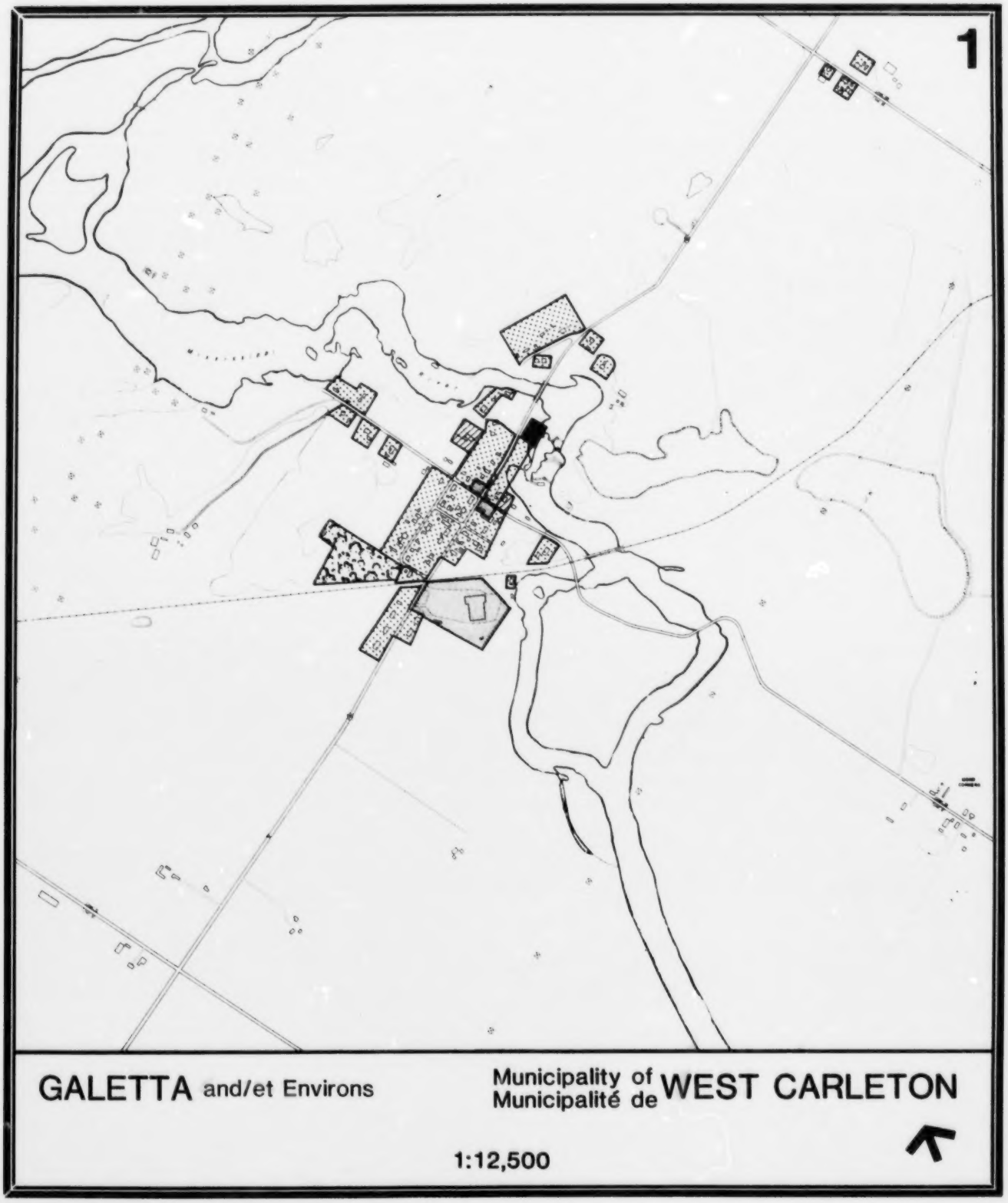
[2] Industrial includes Transportation/Communication/Utilities land use.

[3] Marsh is generally regarded as a land use which overlays both Agriculture/Cleared Land and Woodlands. In 1985 only, land which was exlusively marsh is reported separately.

1985 VILLAGE AND ENVIRONS LAND USE



UTILISATION DES TERRAINS DU VILLAGE ET DES ENVIRONS - 1985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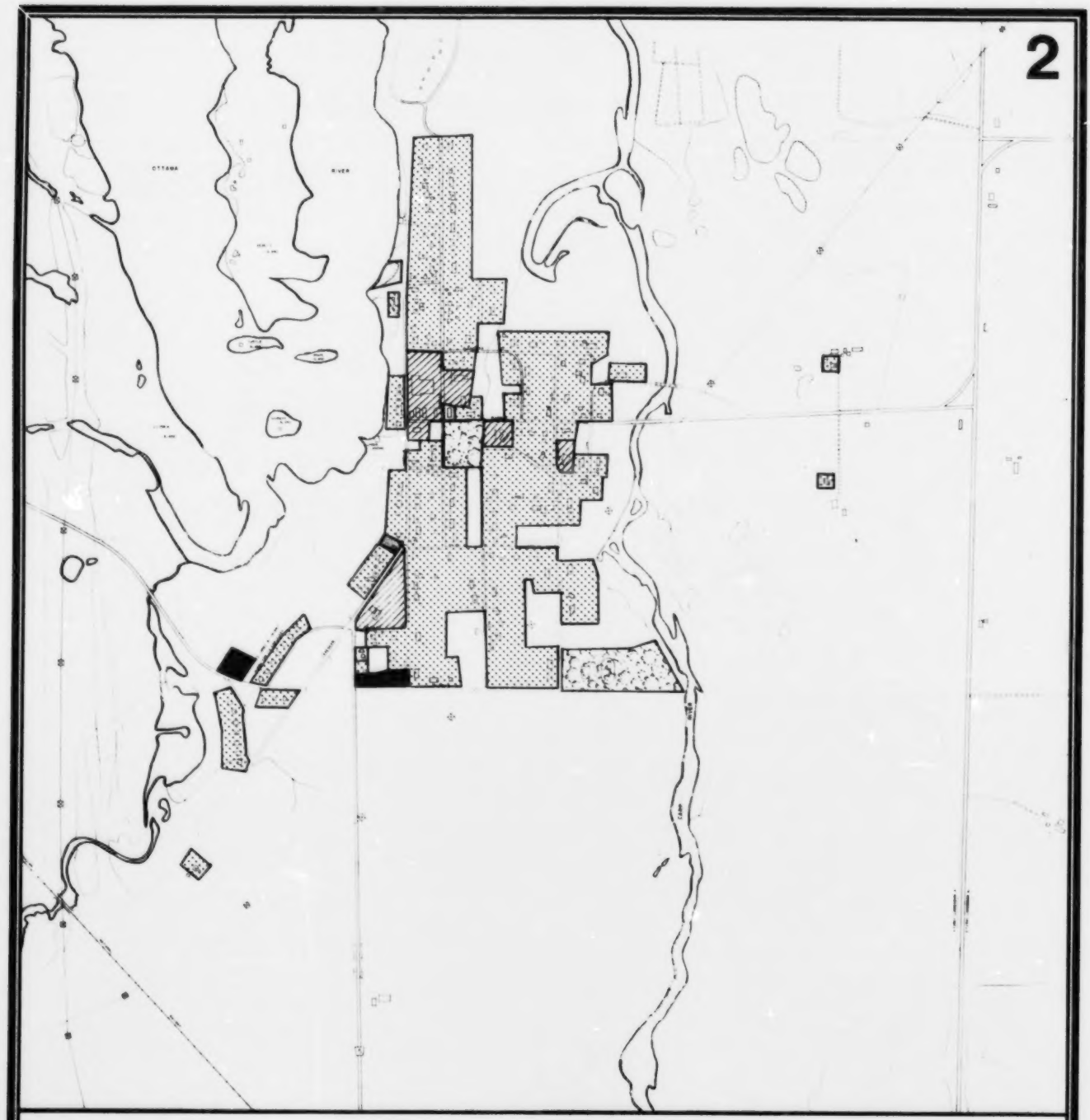

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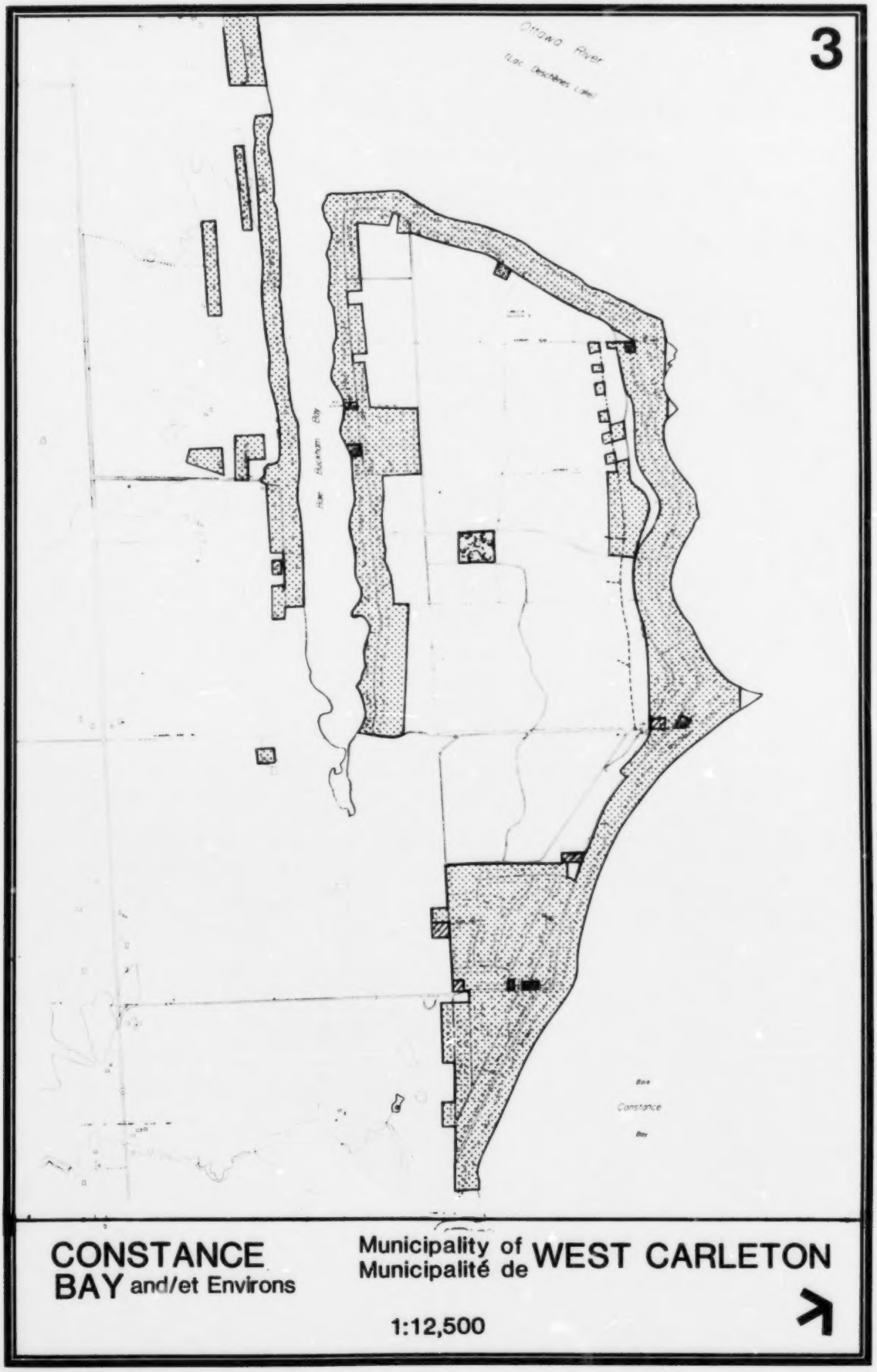

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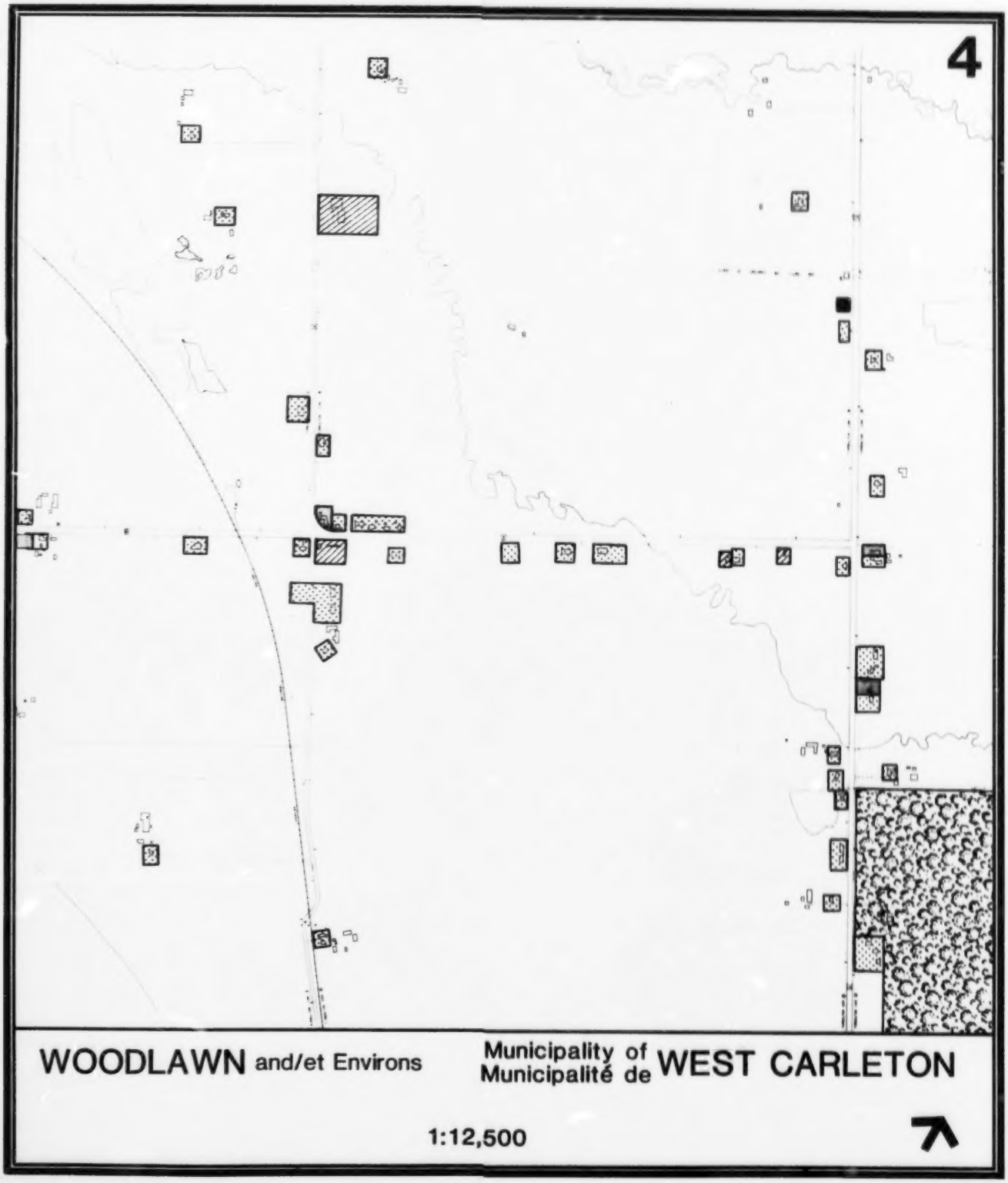
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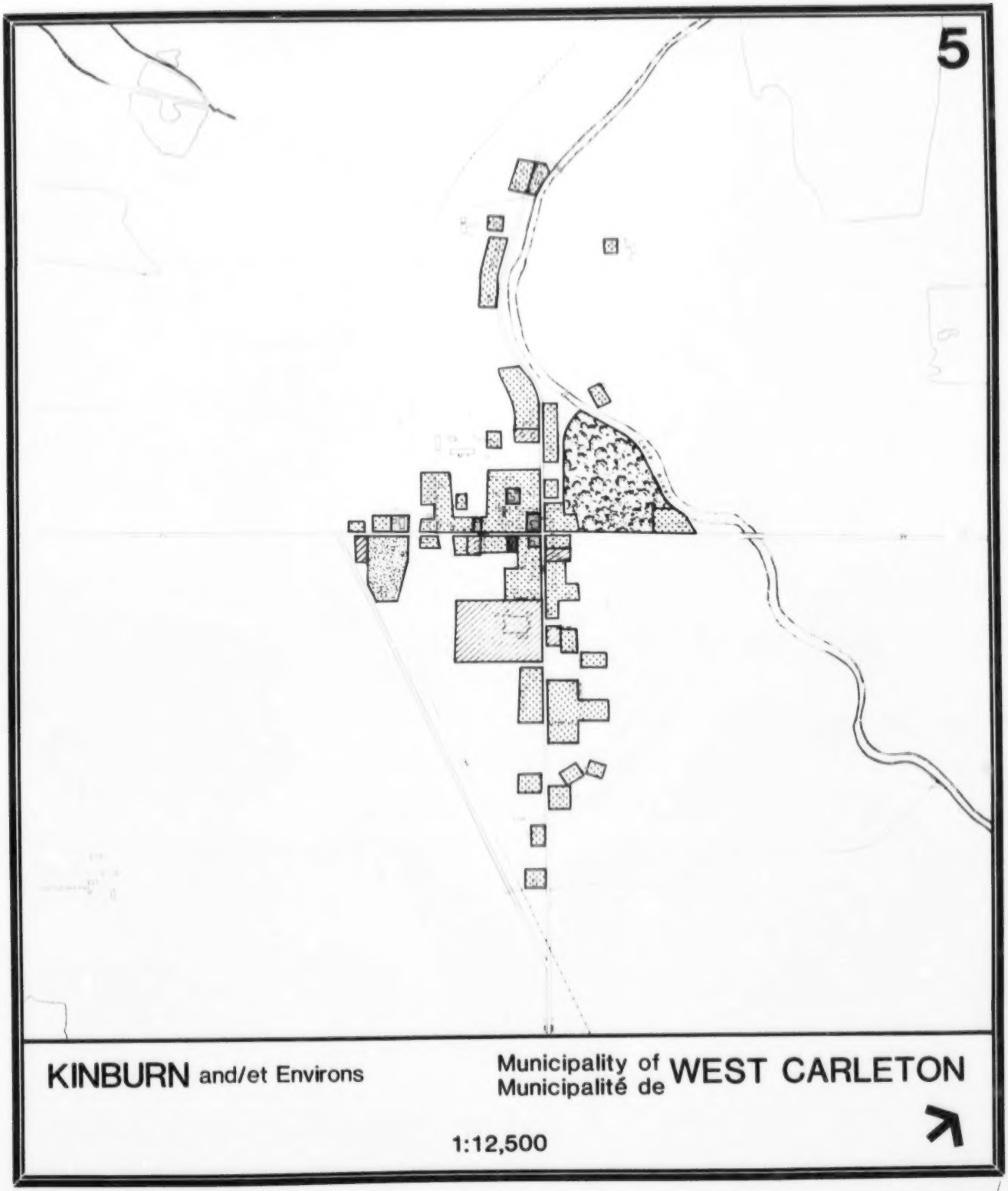
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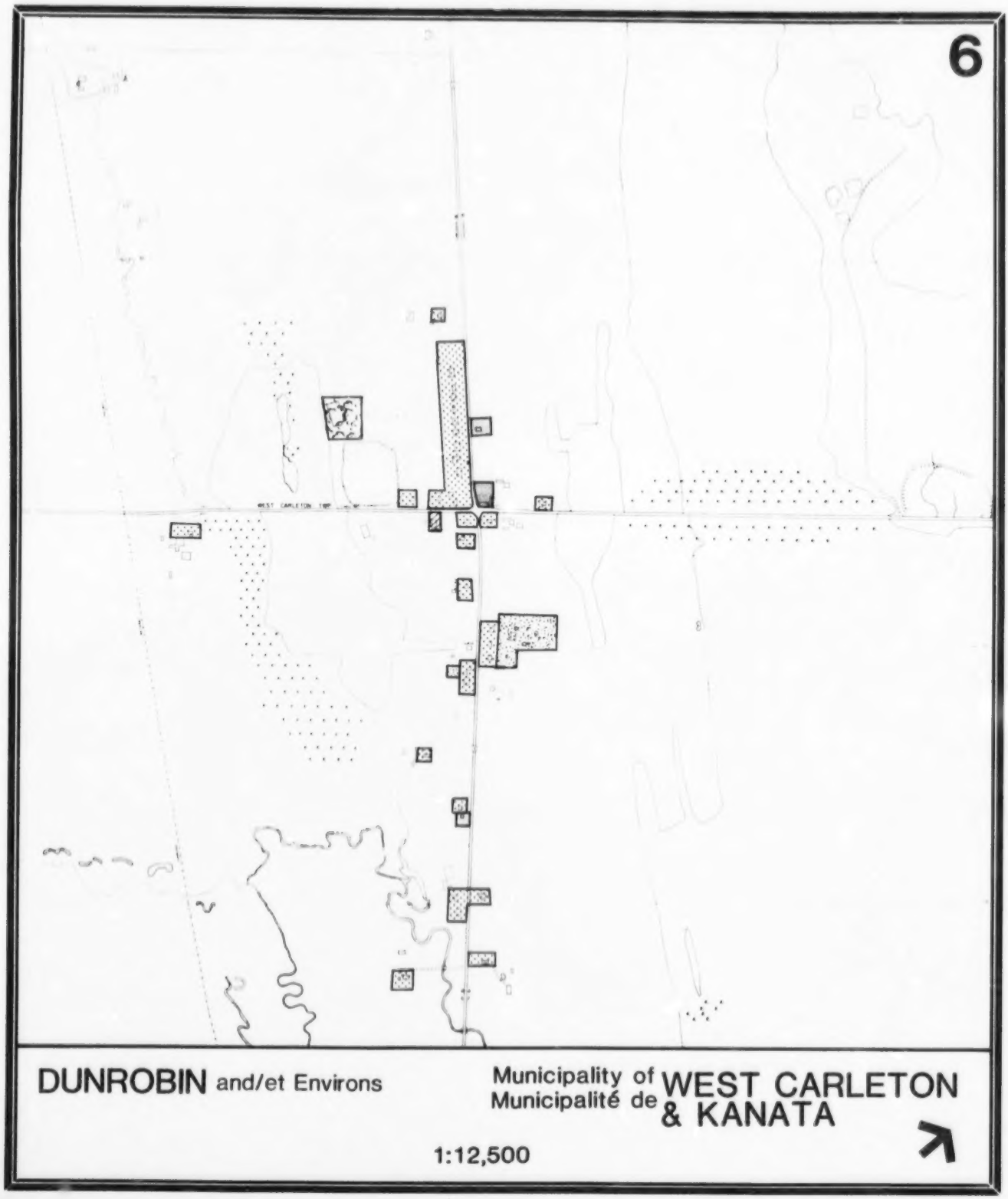
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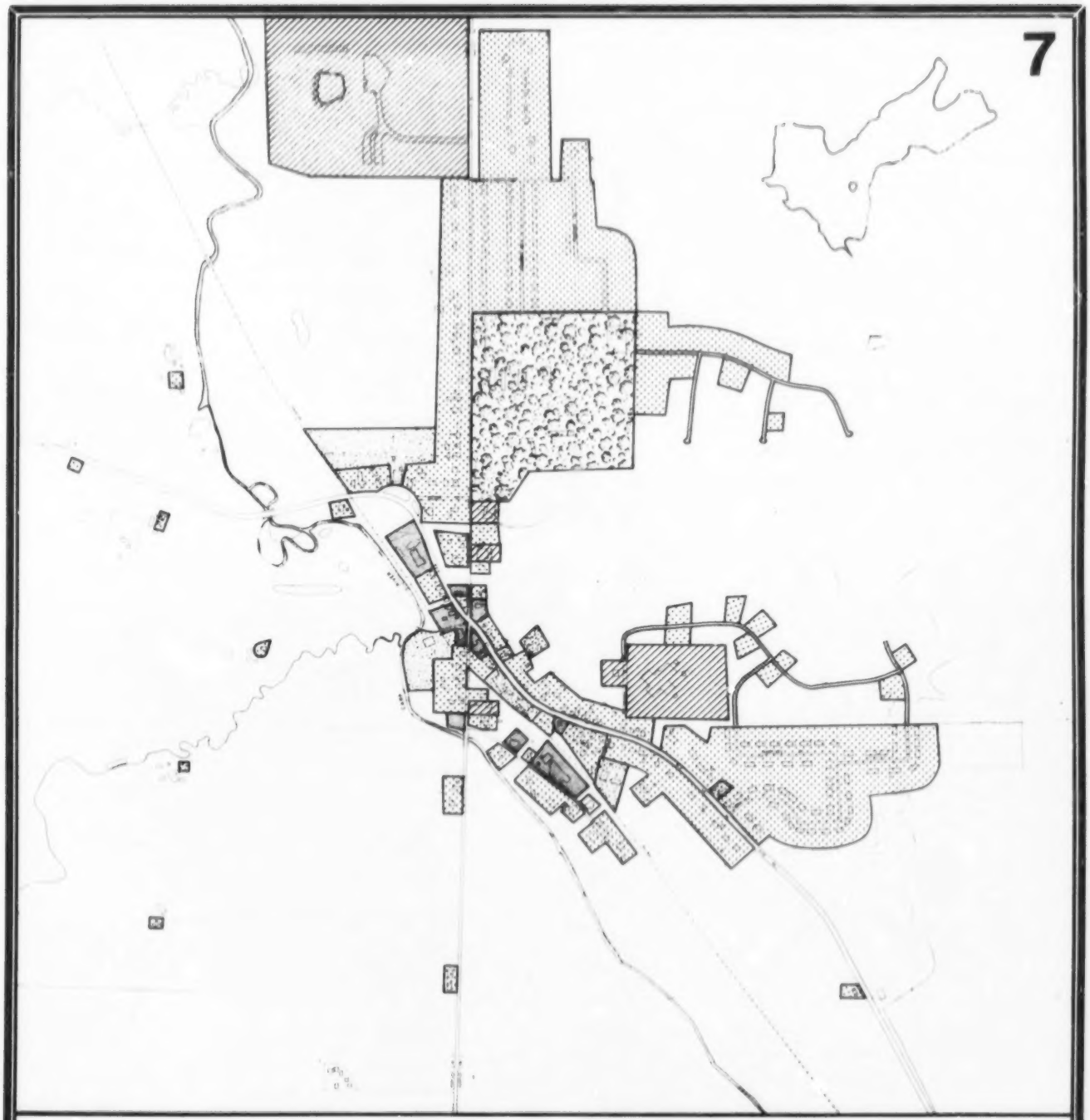
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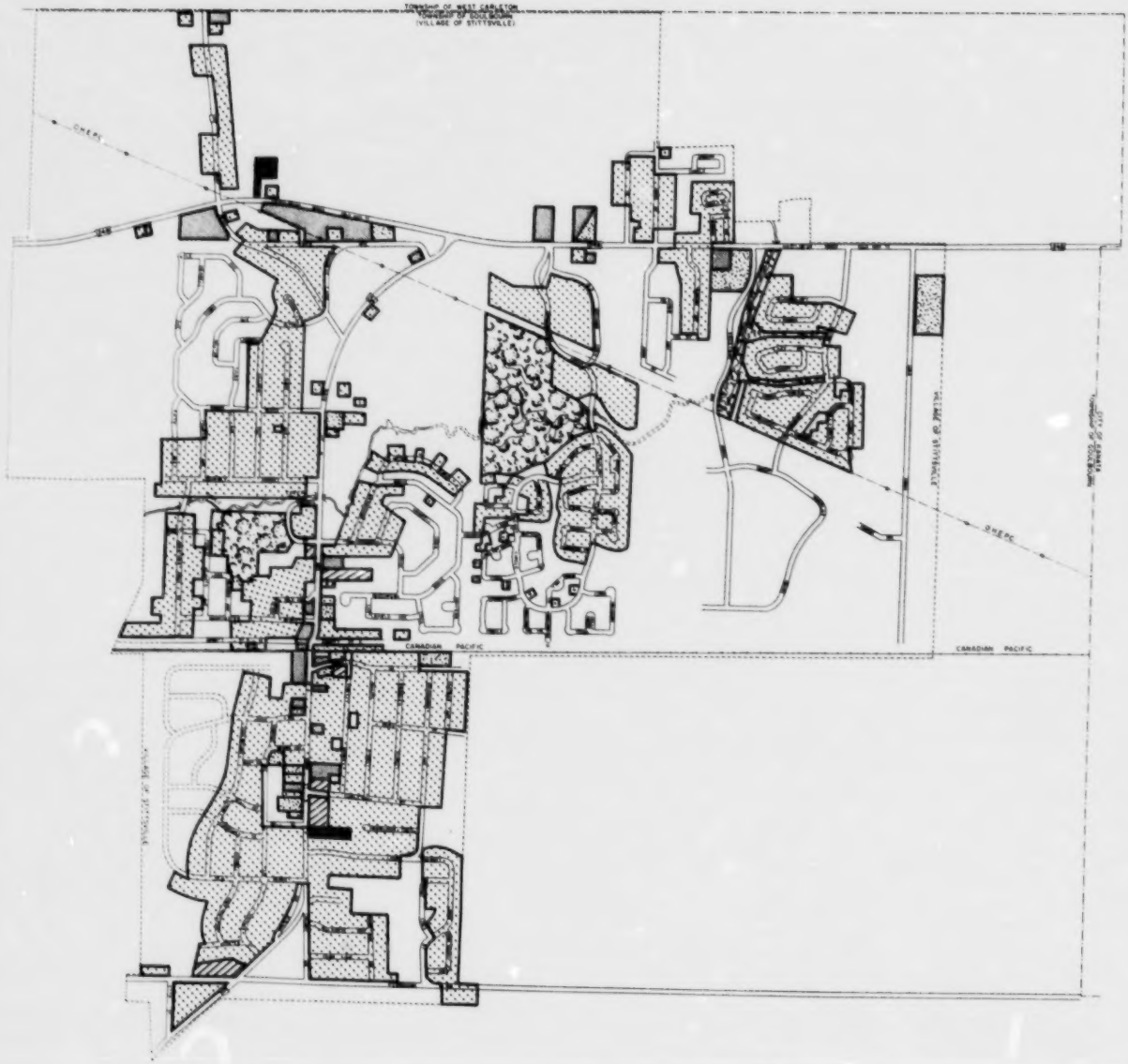

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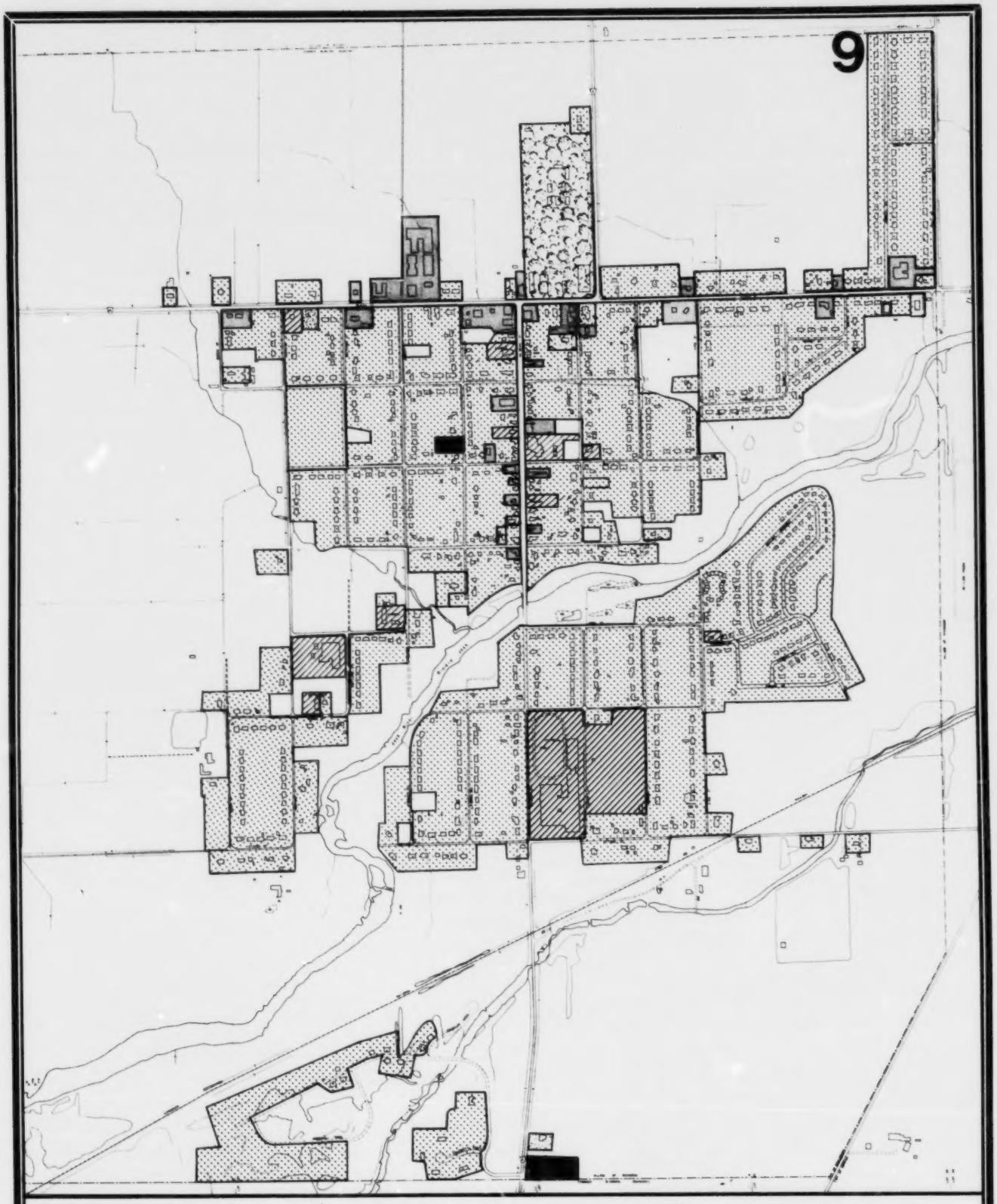

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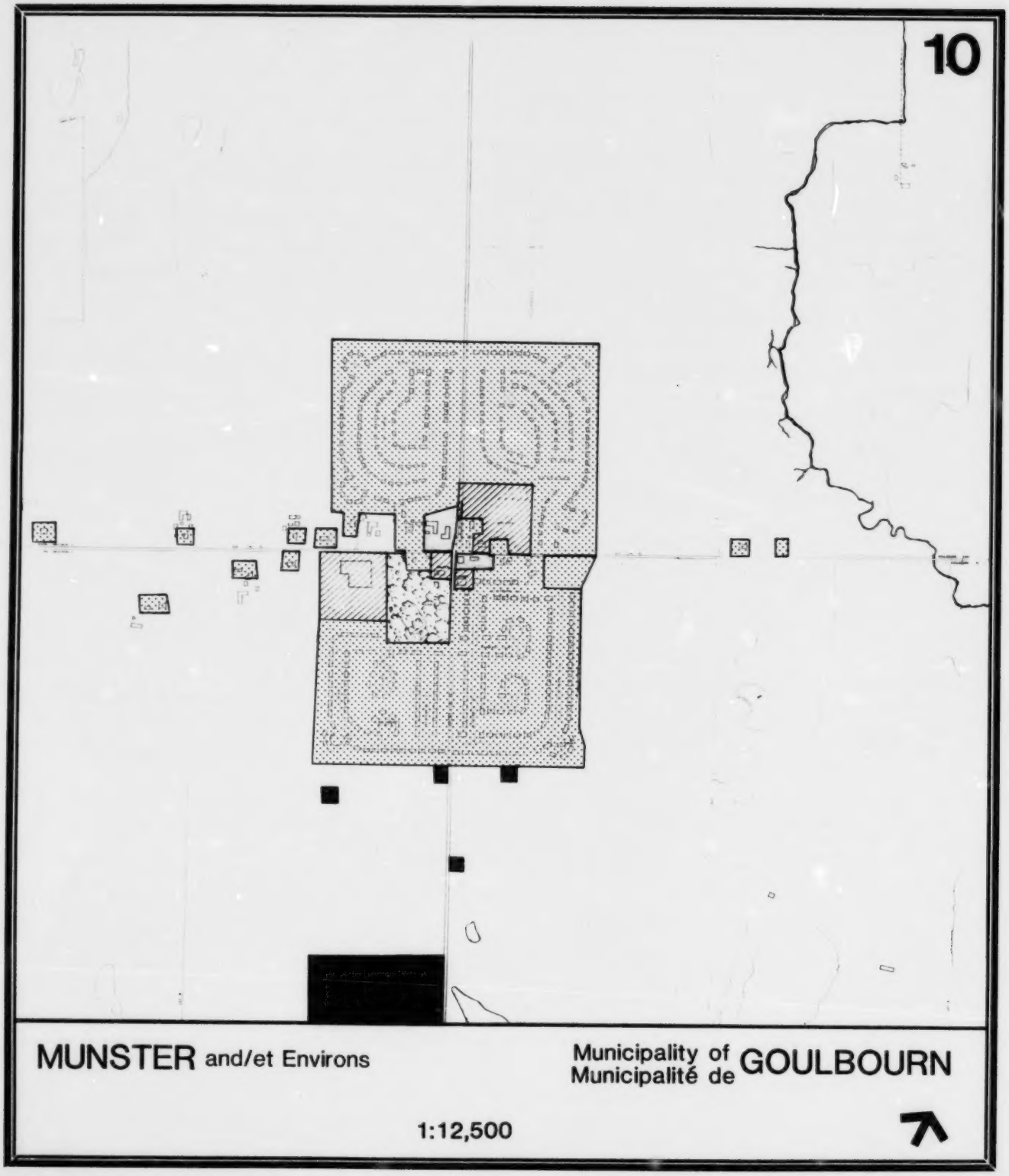
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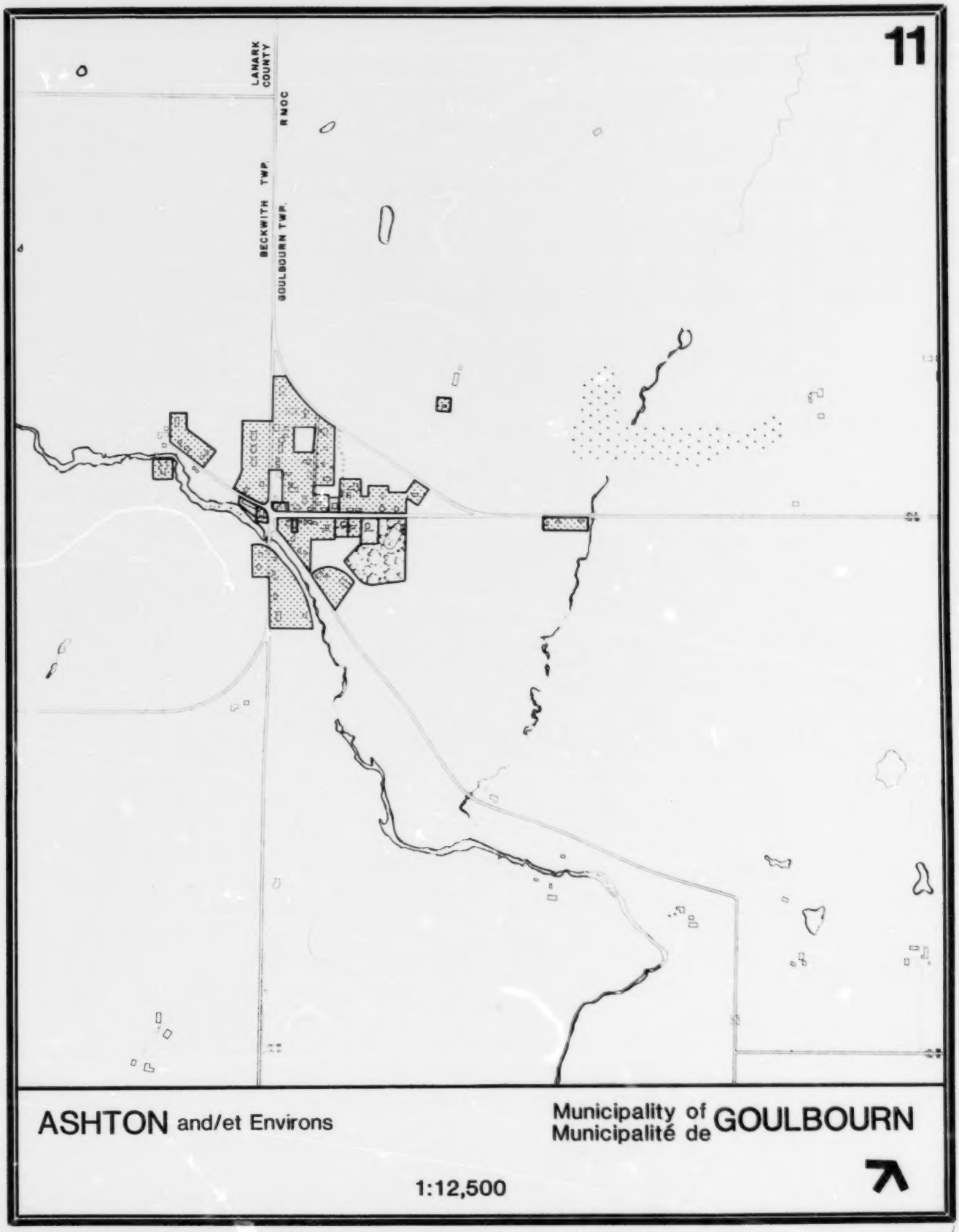
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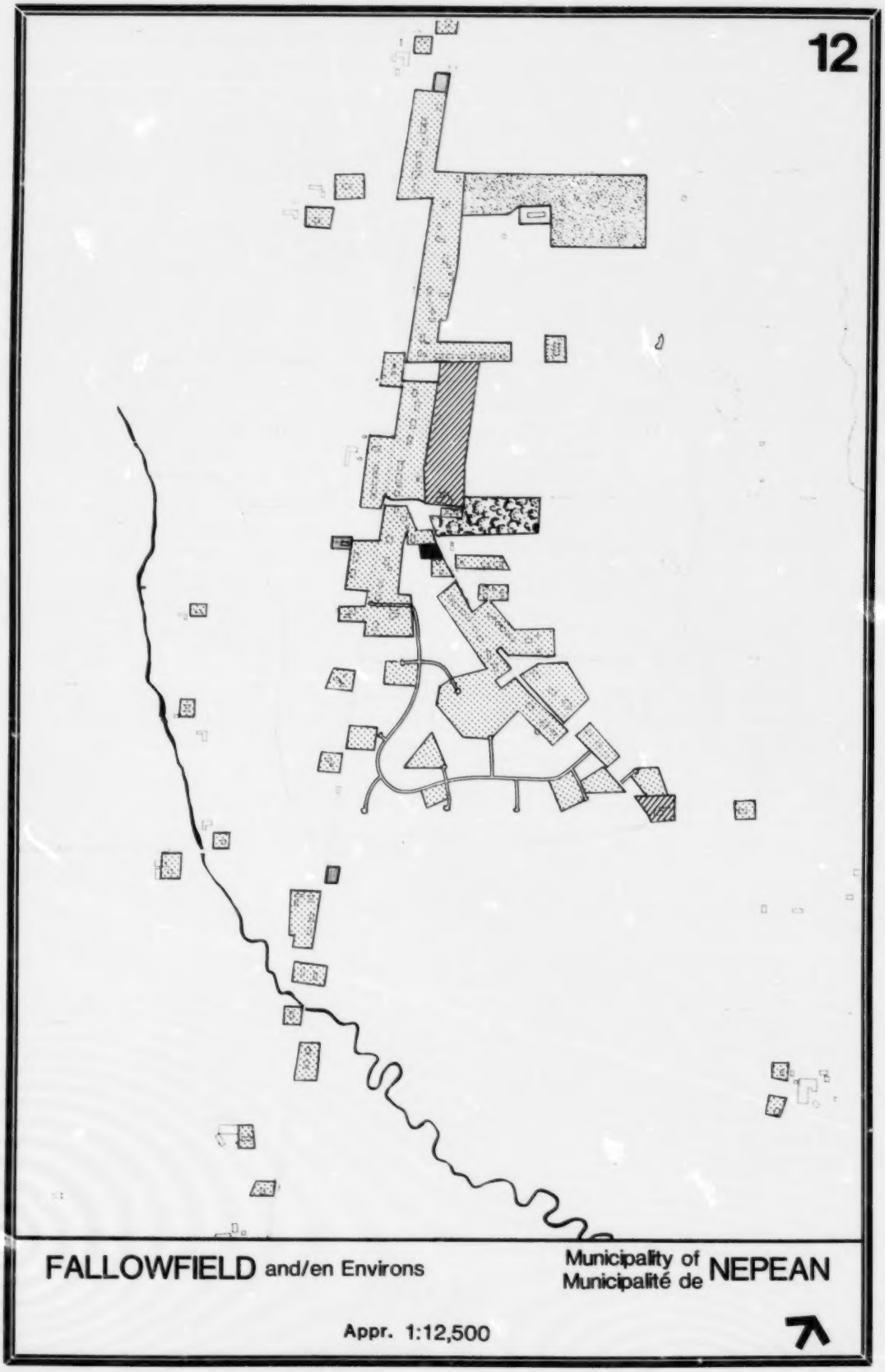
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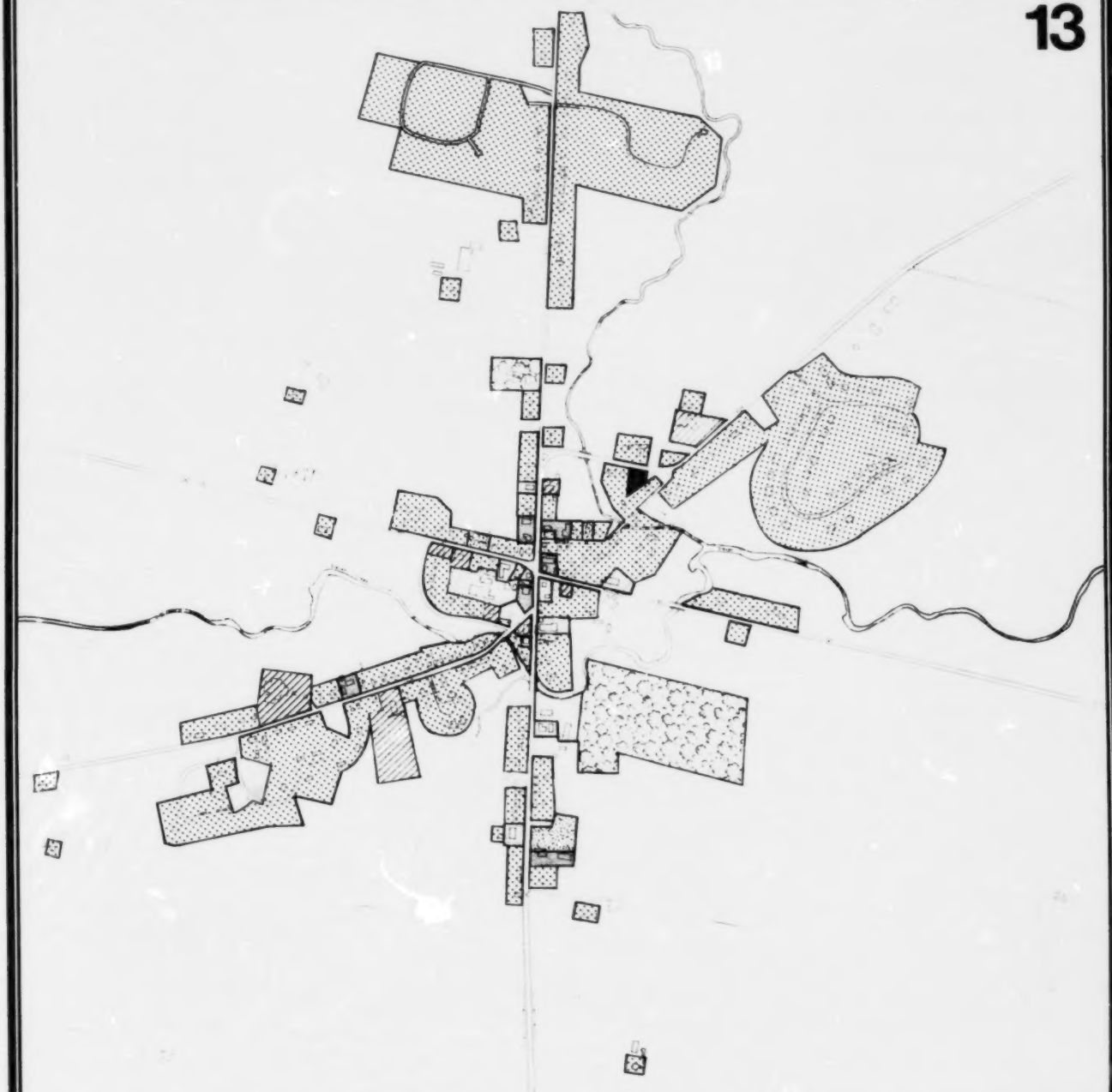

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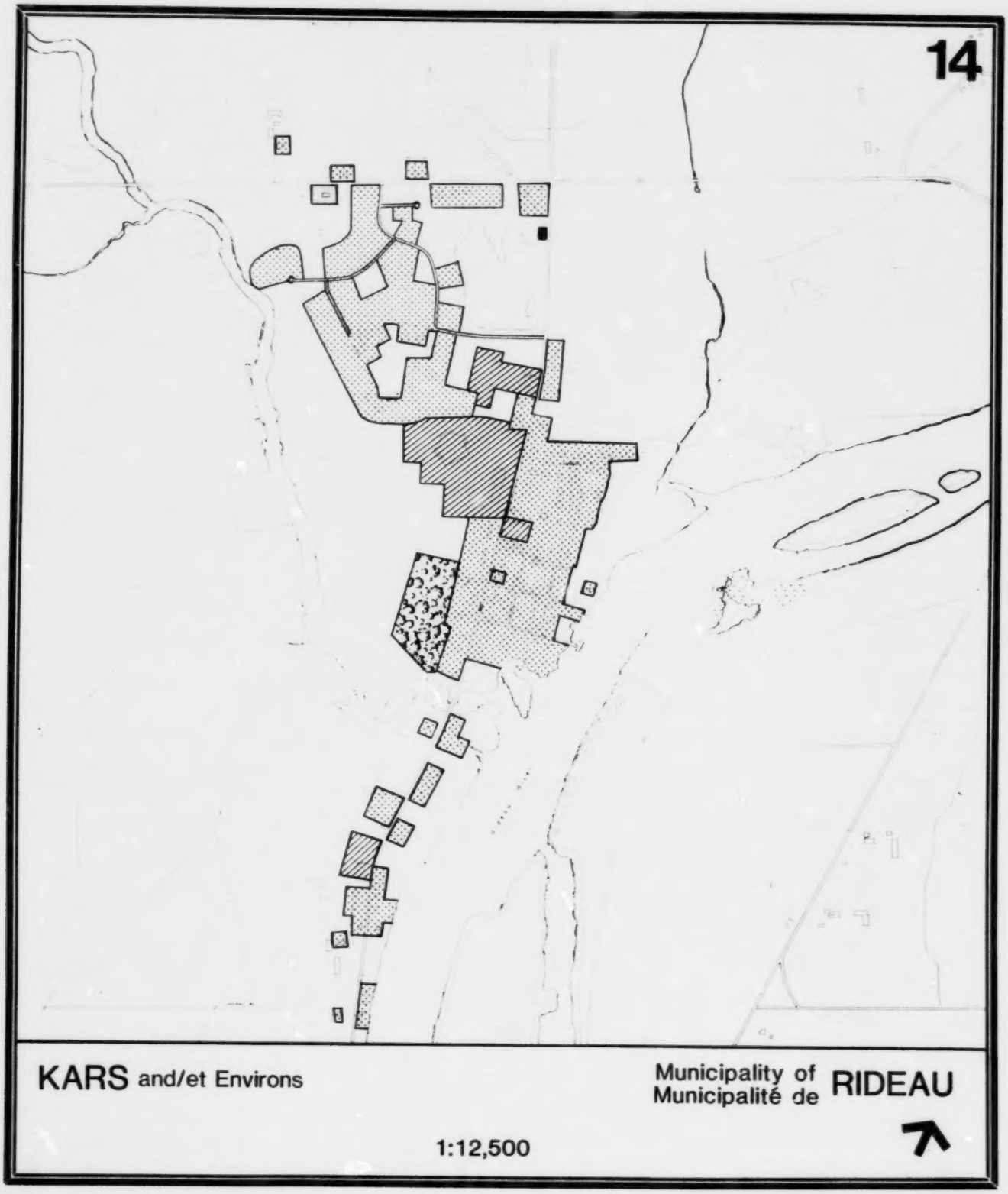
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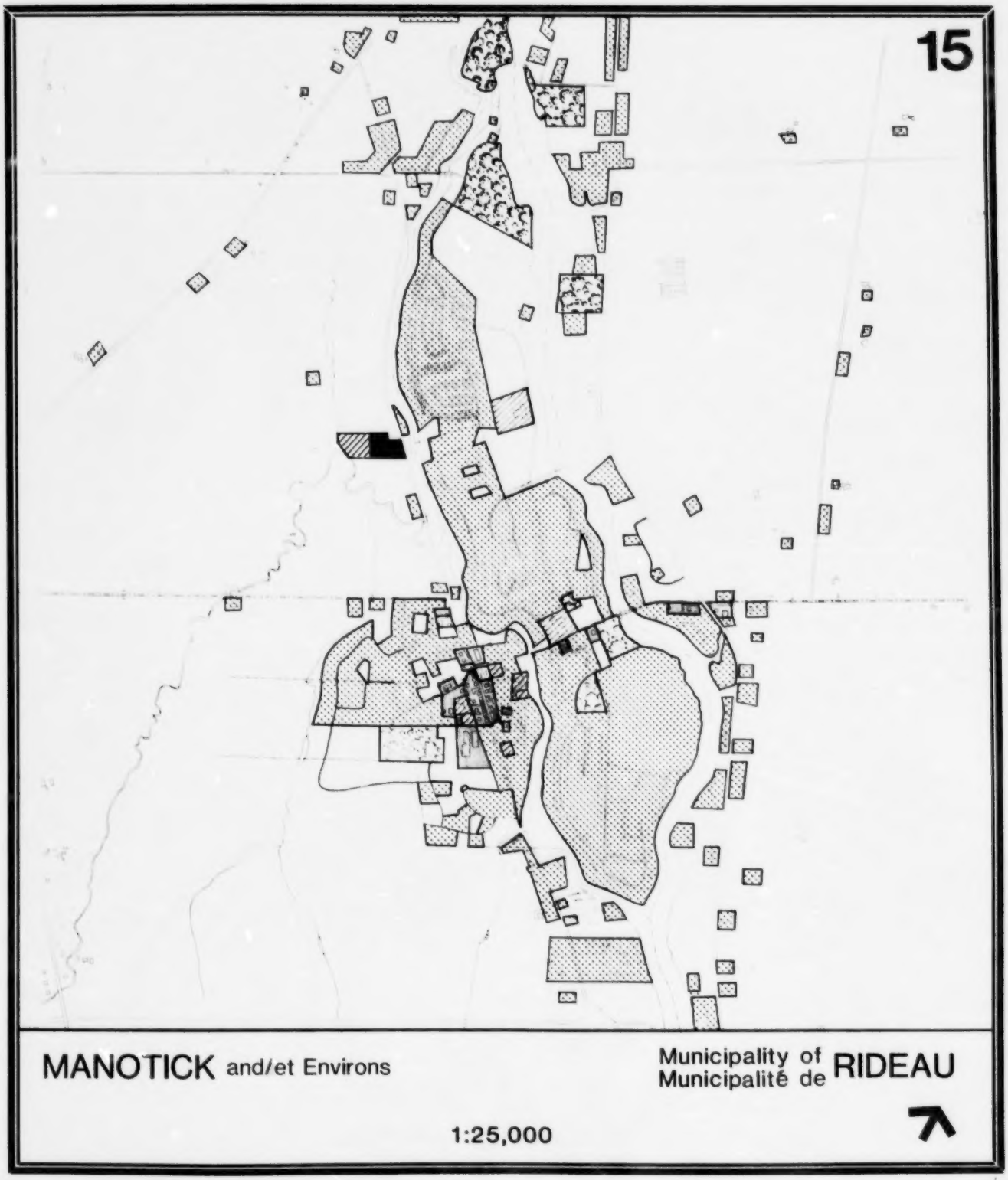
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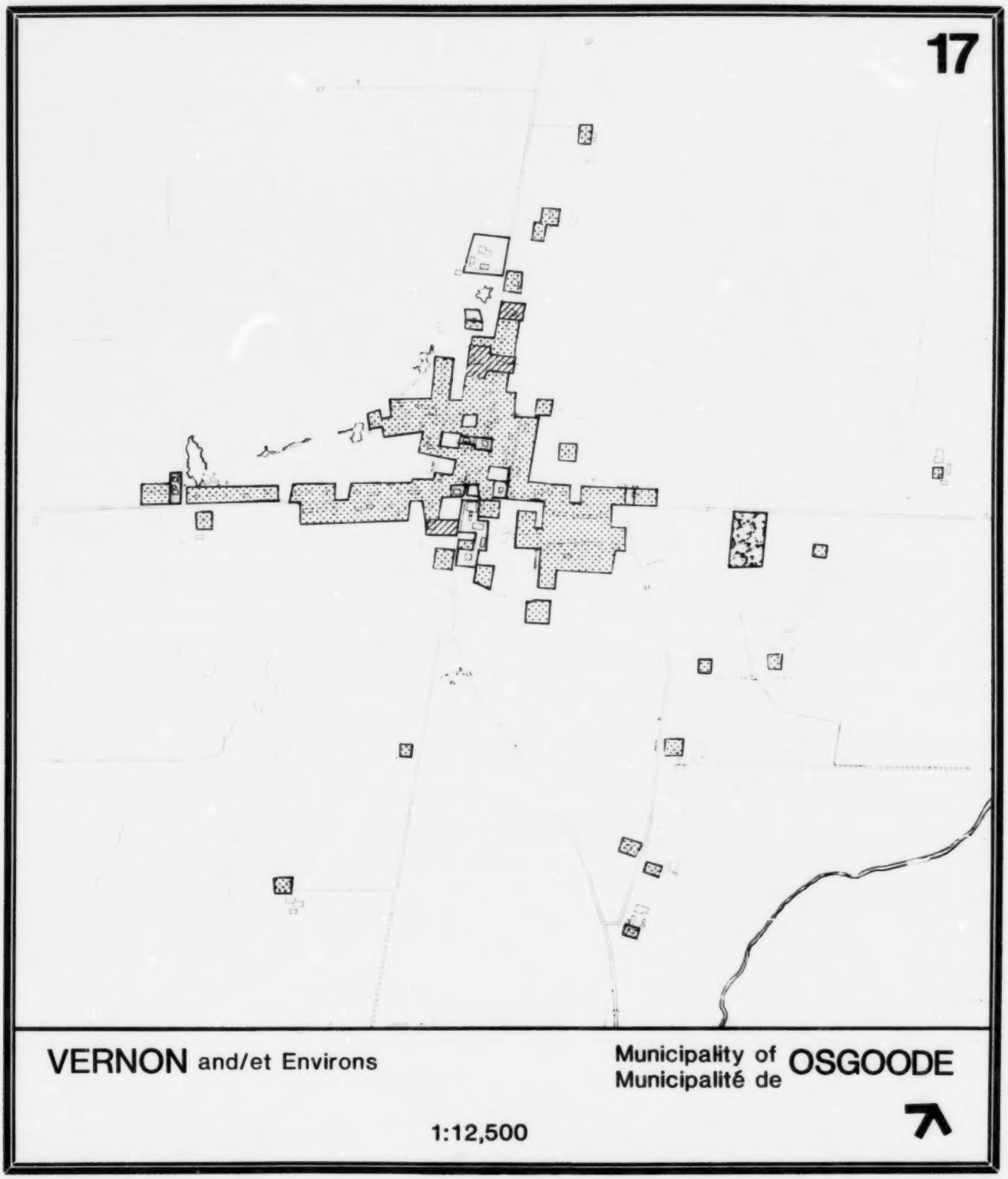
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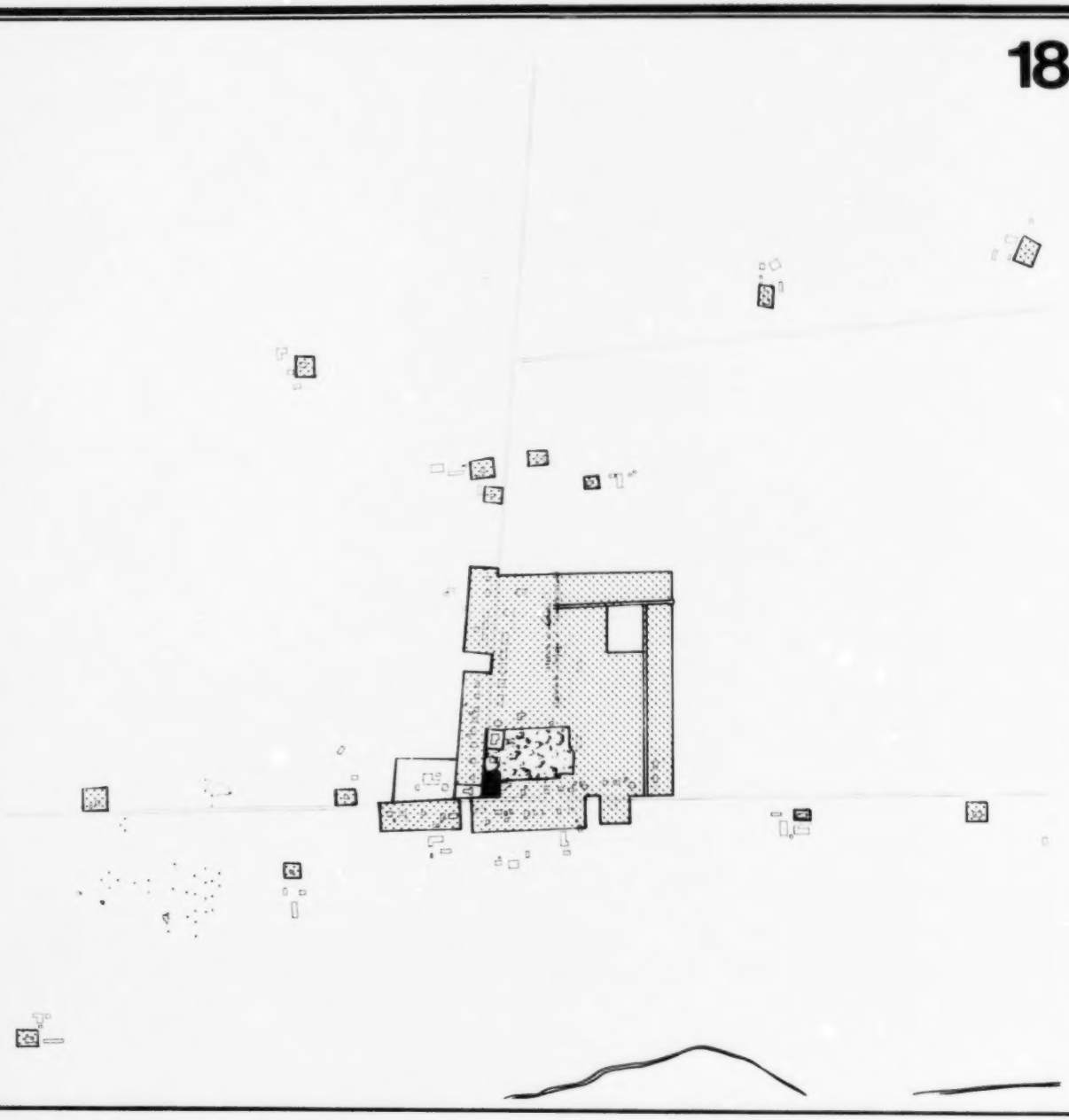

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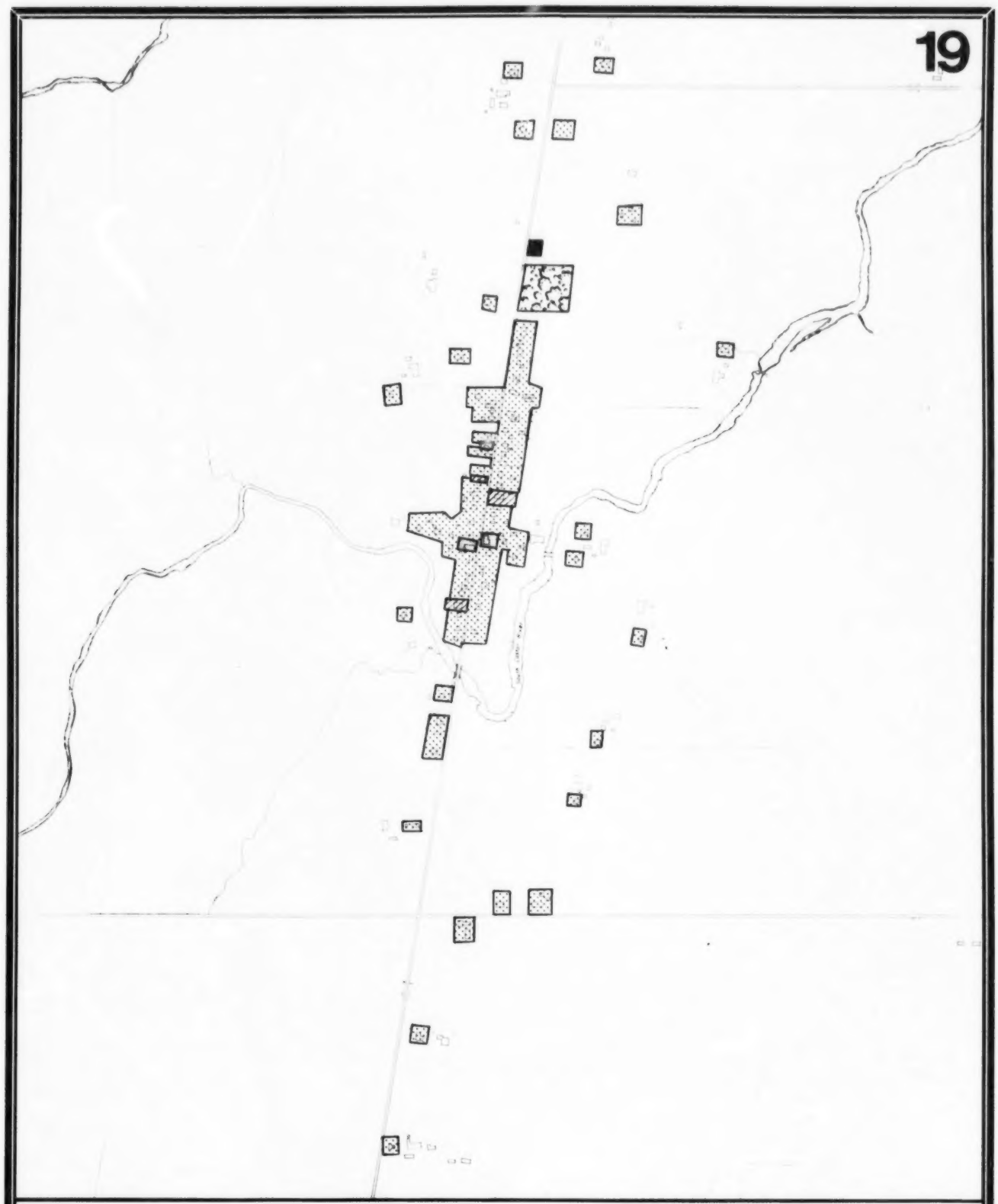

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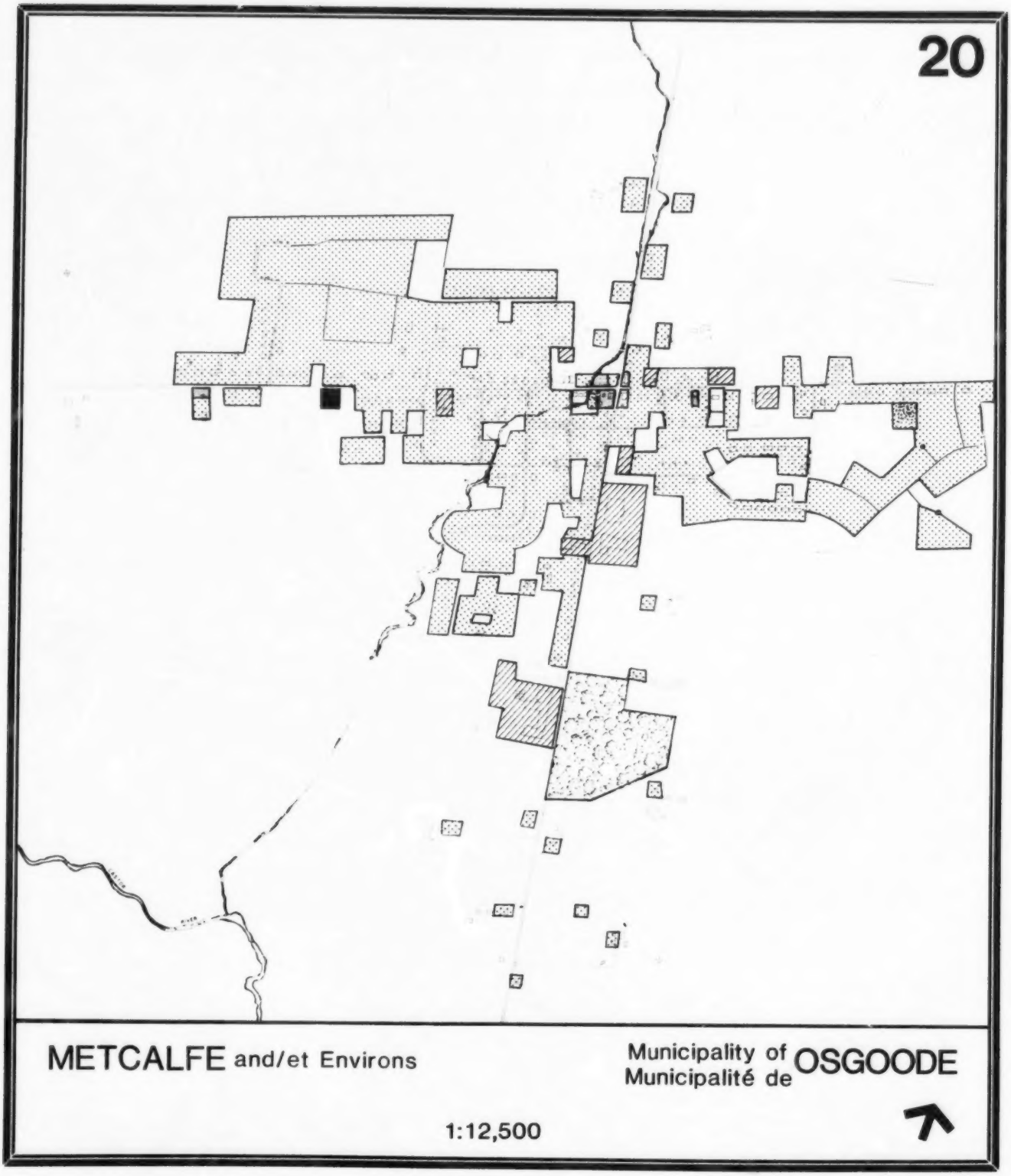
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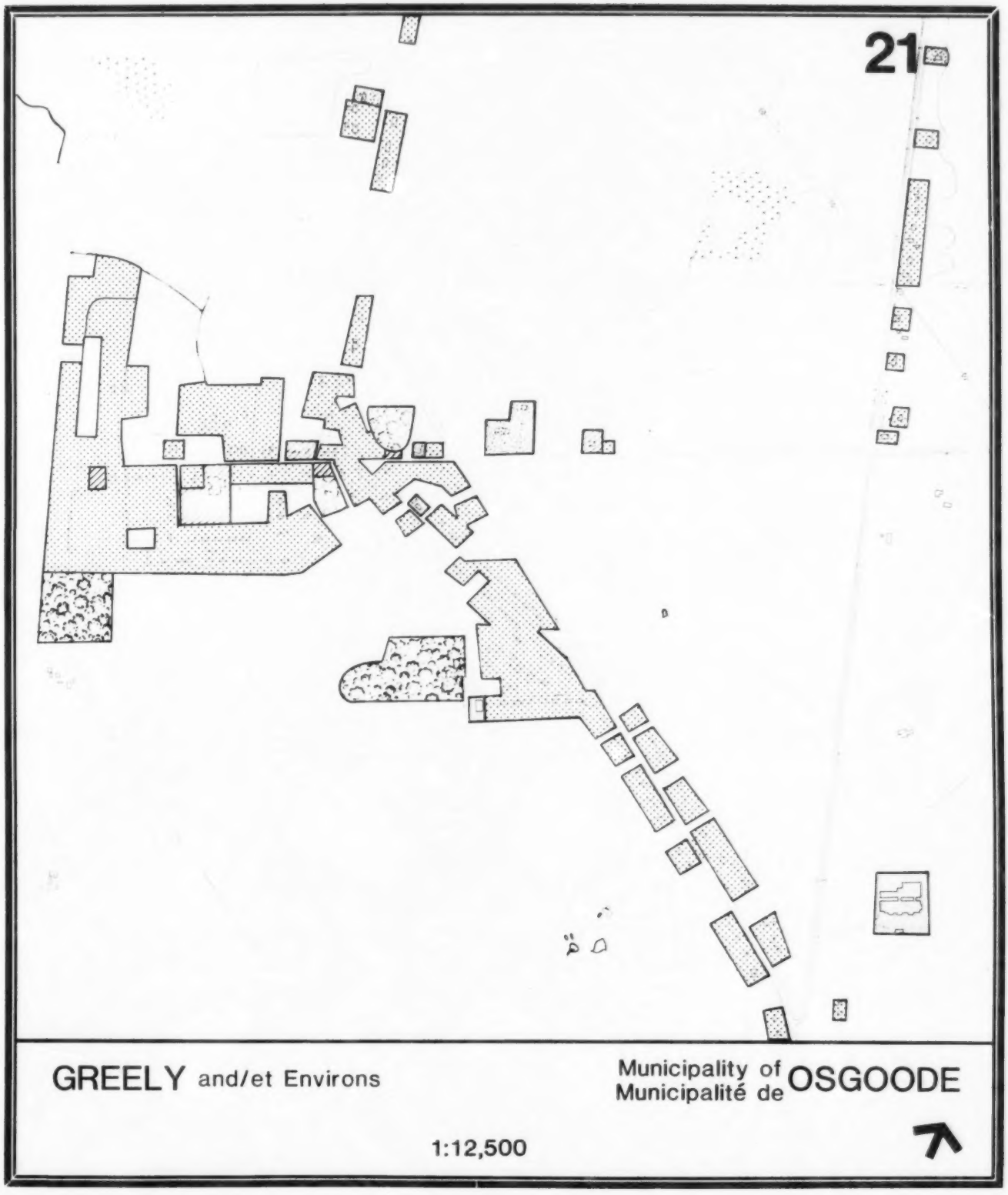
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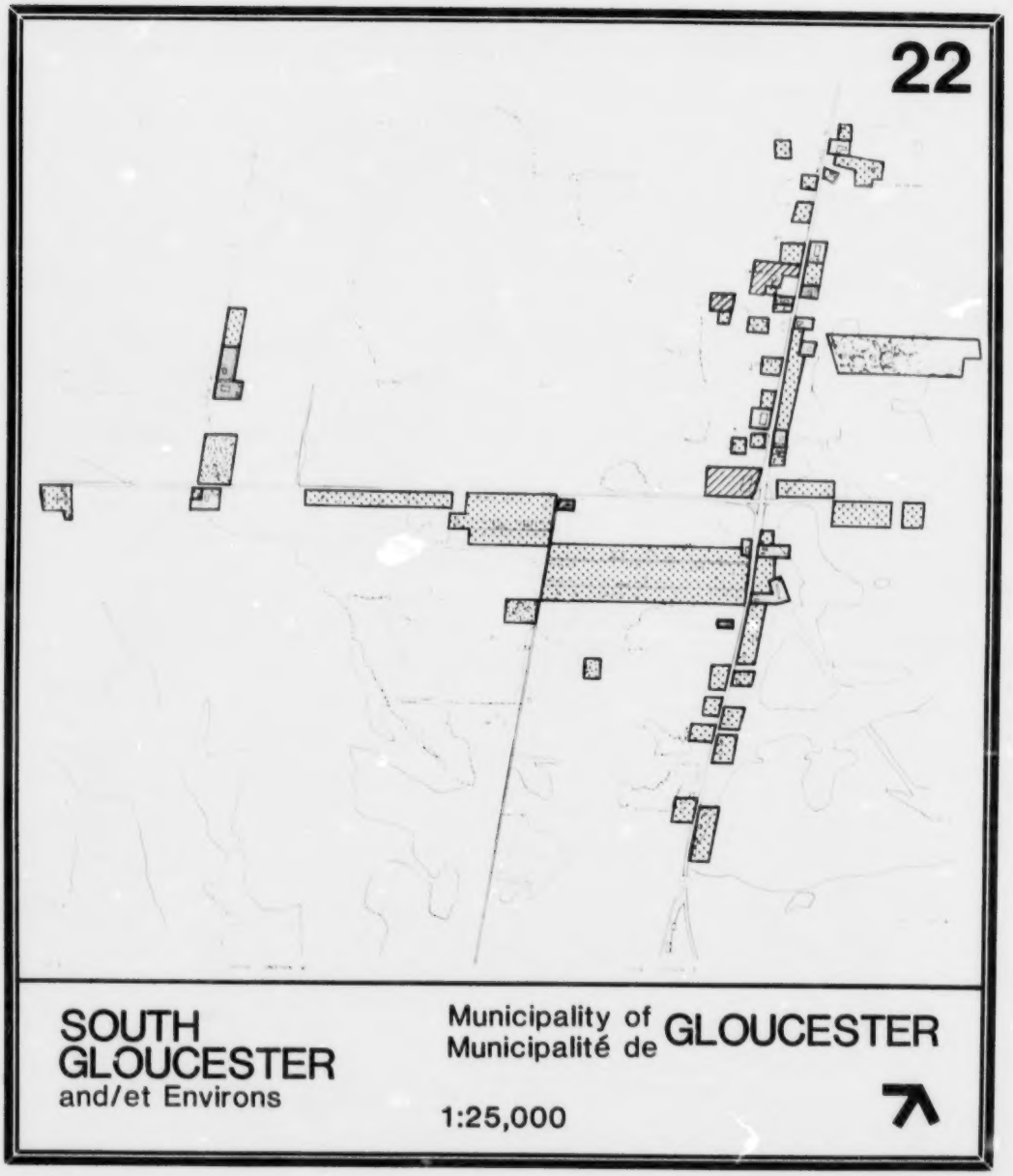
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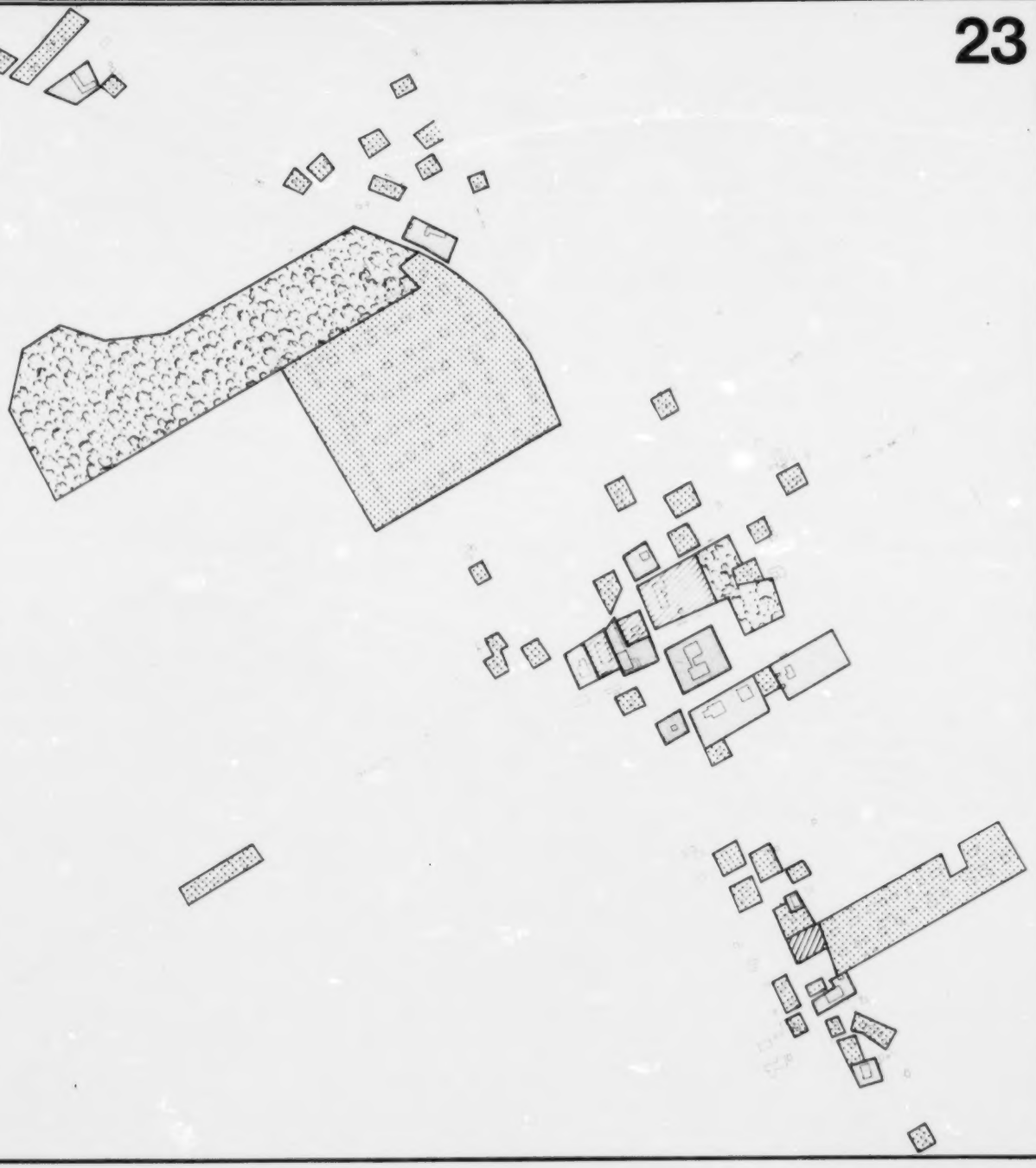

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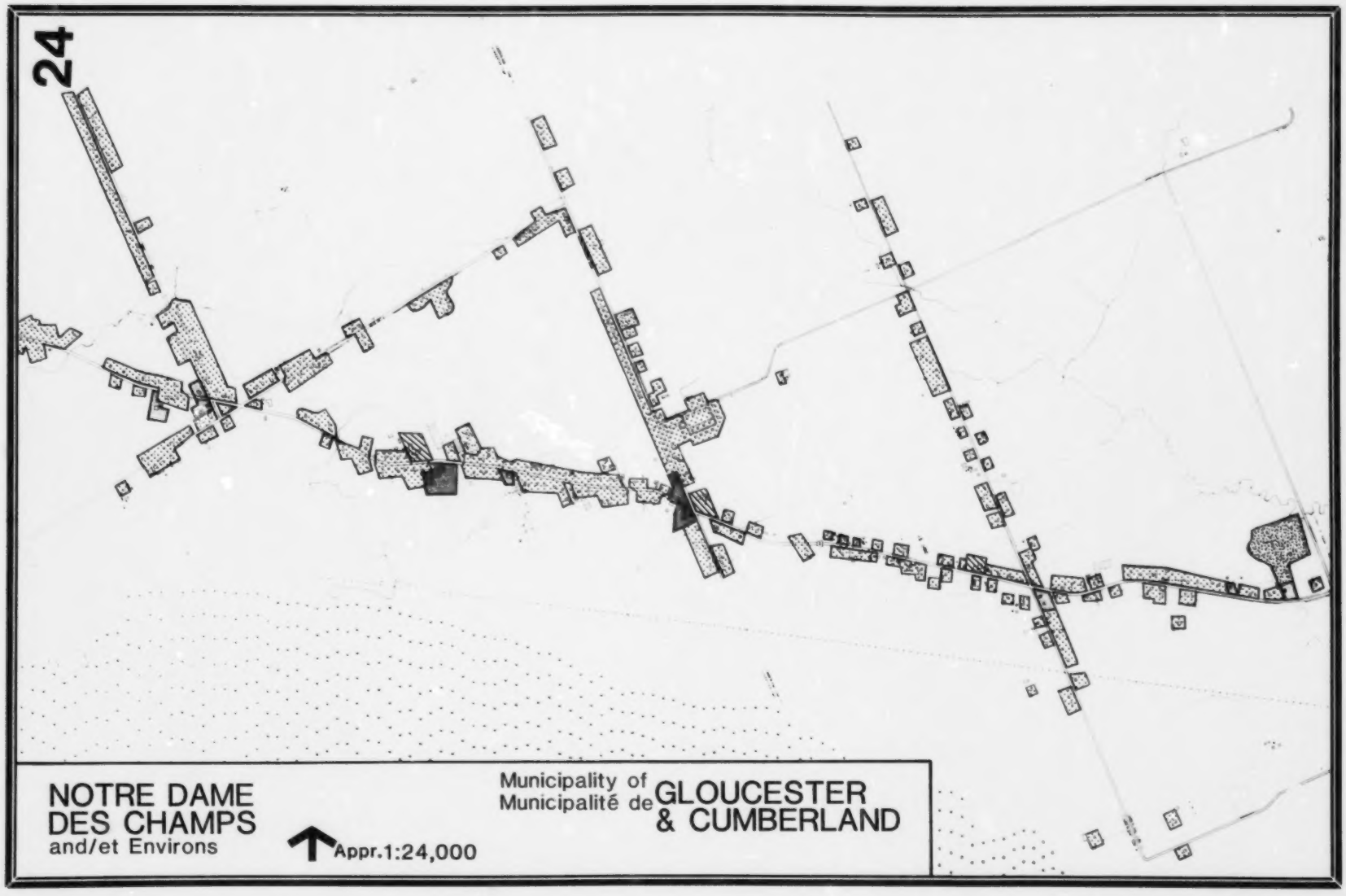
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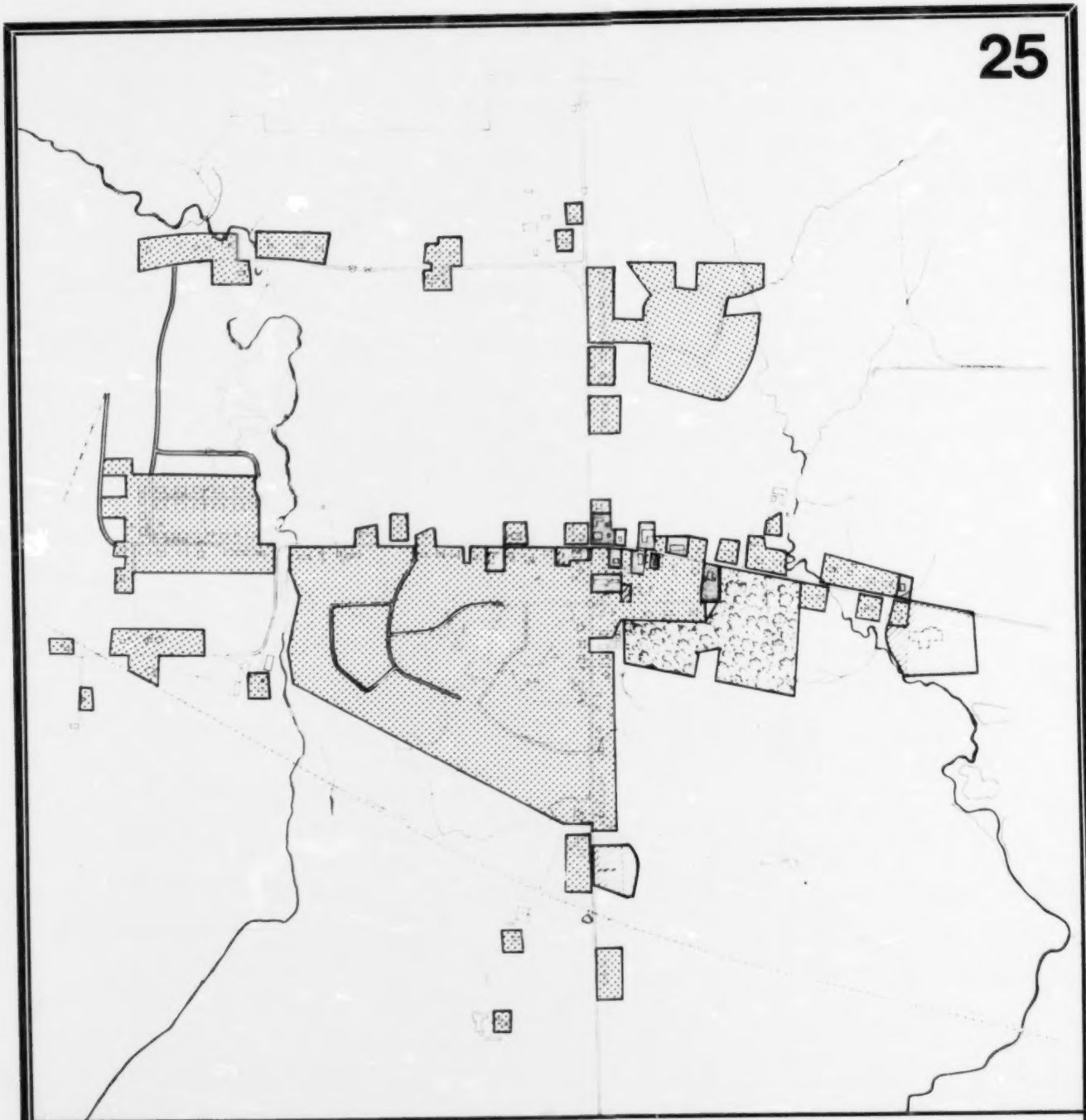
& CUMBERLAND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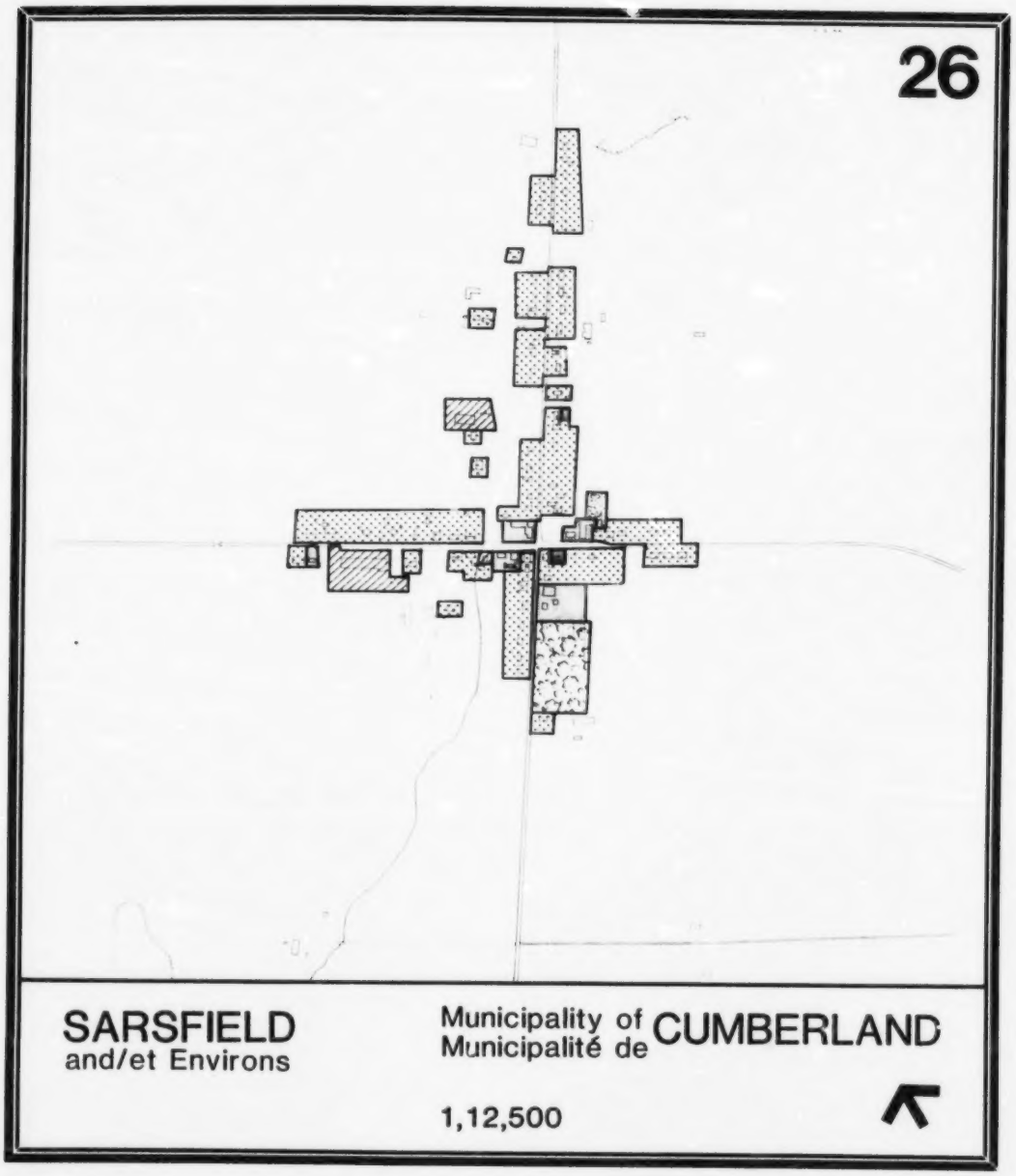
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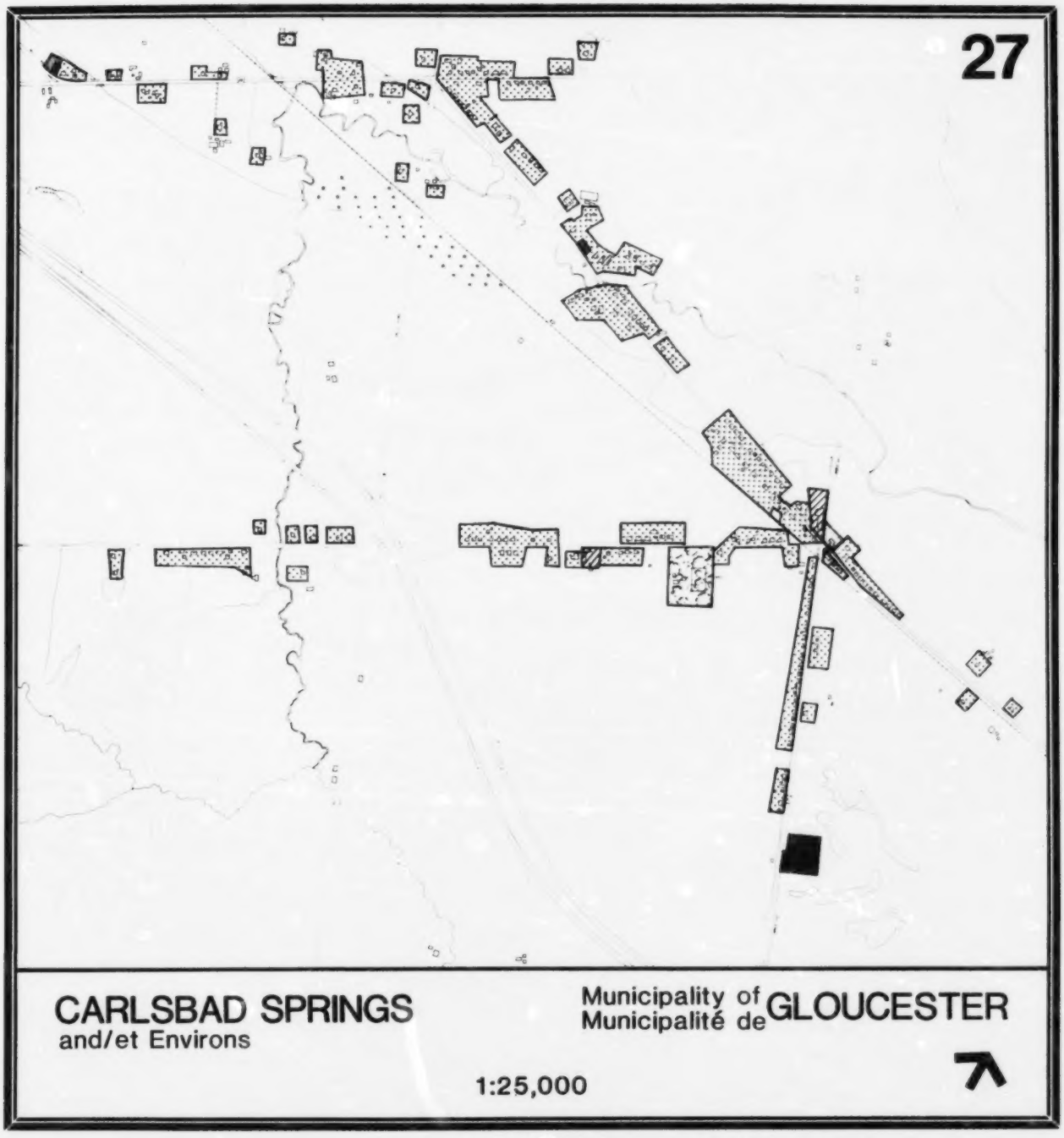

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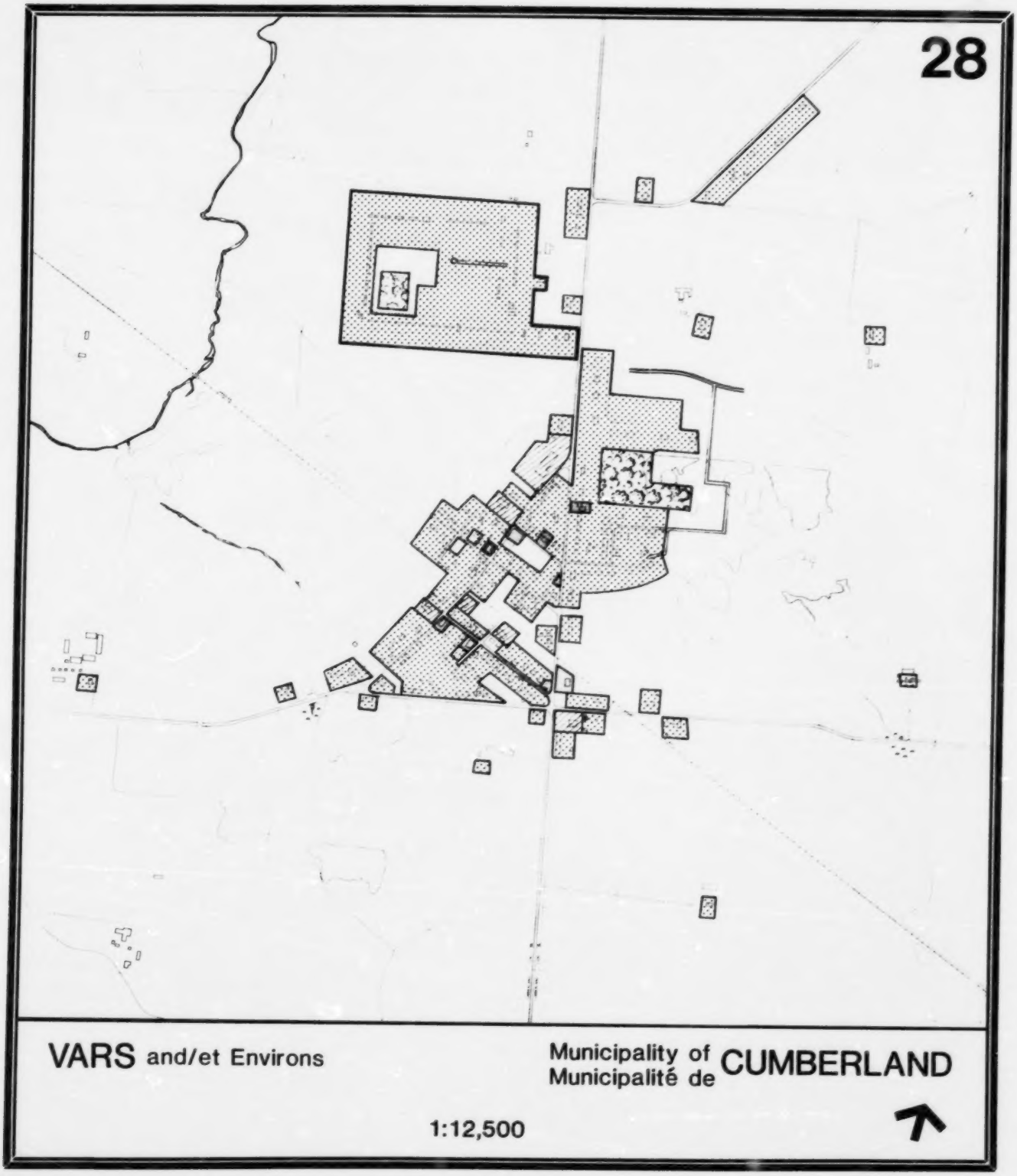
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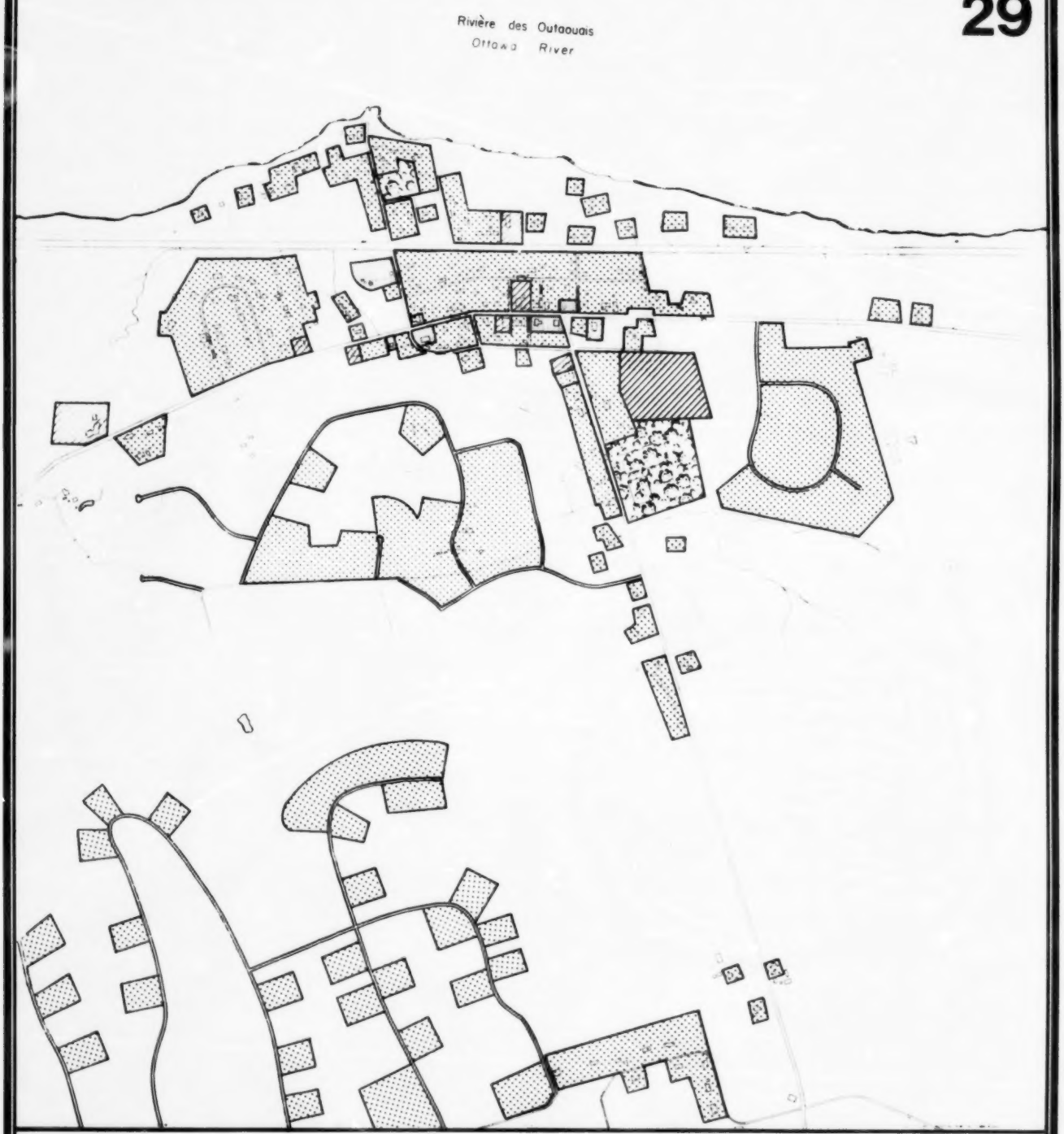

CUMBERLAND
and/et Environs

Municipality of
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1:12,500